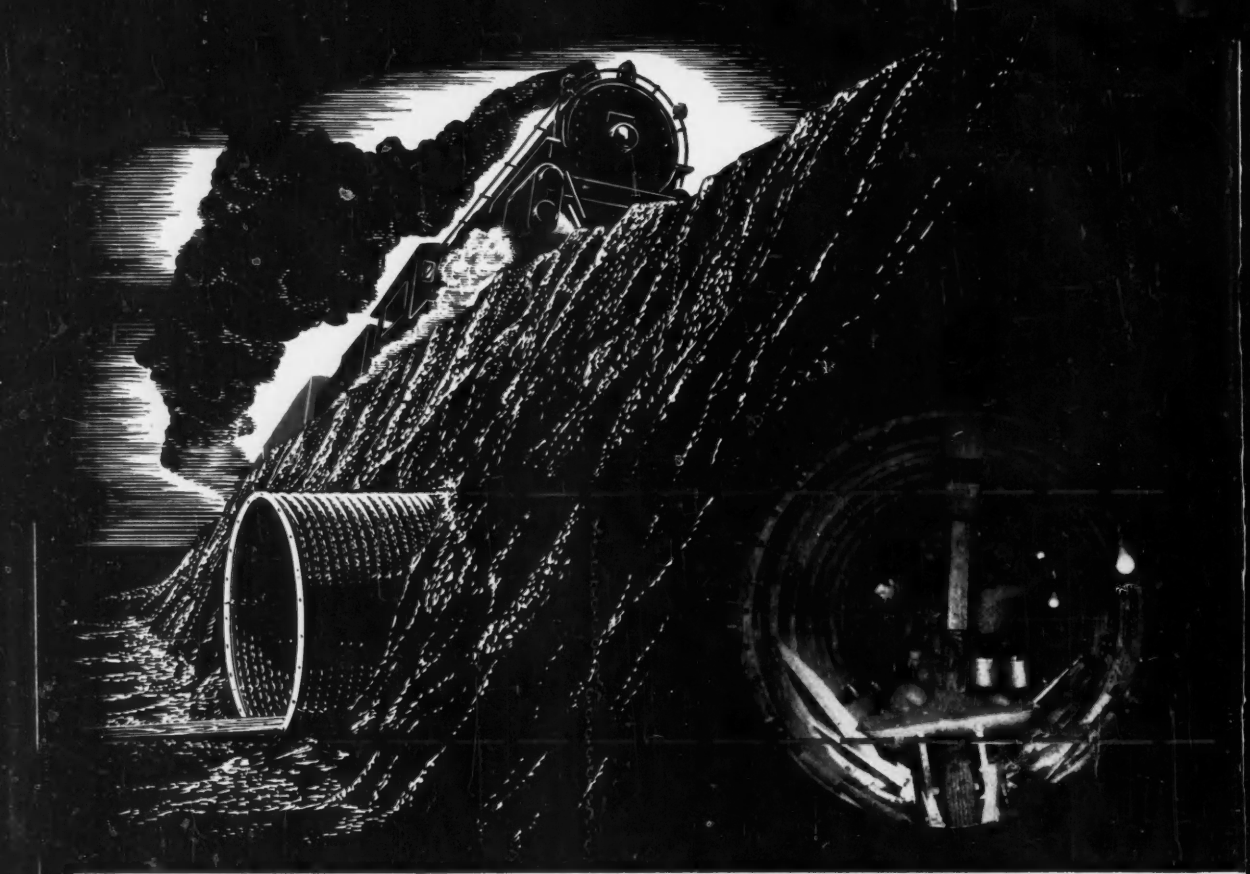
ENGINEERING NEWS-RECORD

A McGRAW HILL PUBLICATION



It helps keep contractors "off the hook"

Situations requiring special knowledge and equipment have long been a thorn in the profit side of even the most experienced general contractors.

More than twenty years ago Armco decided to lend a helping hand. They organized the Armco Construction Service to work with contractors, engineers and others on a subcontract basis. Being specialists in the installation of drainage and metal products they could do even unusual jobs quickly and economically. Special techniques and machinery were developed. In other cases rather commonplace equipment was put to exceptional uses. All this with the idea of saving time and money.

Today, the Armco Construction Service has completed thousands of subcontracts including jacking, tunneling, boring, threading and open trench installation of all drainage products. Also included are complete subdrainage systems and the erection of steel buildings. They have the experience, ability and financial resources to meet and handle all kinds of situations encountered in their specialized field. Users of this service have learned it is the easy, economical way to protect themselves on bids and estimates, reduce labor costs and save construction headaches.

For more than 40 years Armco has been striving to provide better service and better products to meet specific needs. A few examples are FLEX-BEAM Guardrail, PIPE-ARCH, STEELOX Buildings and sturdy MULTI-PLATE Bridges.

Now you can bring your drainage and construction problems to Armco with full assurance you will receive all the benefits of long experience, extensive research facilities, and a real interest in helping you solve these problems.

Armco has a complete range of engineered products and convenient authoritative data to help you. If your problem is difficult or unusual why not talk it over with us?

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MIDDLETOWN, OHIO • OFFICES AND PLANTS IN PRINCIPAL CITIES
SUBSIDIARY OF ARMCO STEEL CORPORATION

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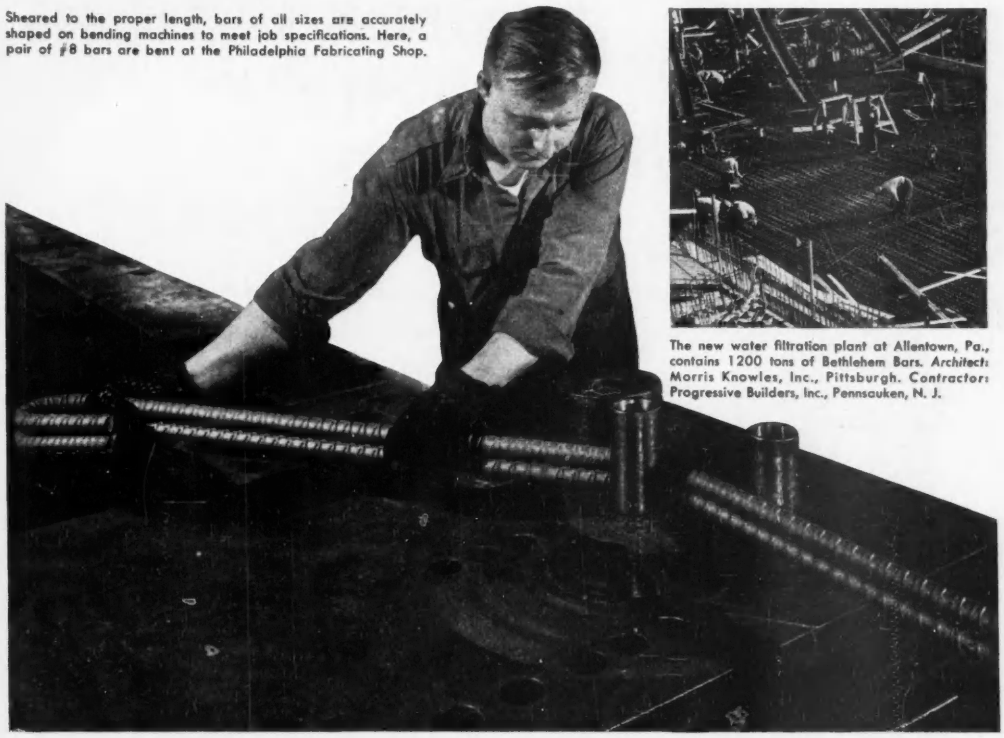
Minneapolis, Minnesota ★ Portland, Oregon ★ Washington, D. C. ★ Guelph, Ontario

Sheared to the proper length, bars of all sizes are accurately shaped on bending machines to meet job specifications. Here, a pair of #8 bars are bent at the Philadelphia Fabricating Shop.



The new water filtration plant at Allentown, Pa., contains 1200 tons of Bethlehem Bars. *Architect:* Morris Knowles, Inc., Pittsburgh. *Contractor:* Progressive Builders, Inc., Pennsauken, N. J.

Bethlehem Bars . . . *fabricated for YOUR JOB*

On most concrete construction jobs, the fabrication of the reinforcing bars you specify should be as important a consideration as the grade of steel or the height and spacing of the bar's lugs.

Bethlehem Reinforcing Bars score on all counts. Only new-billet steel goes into these bars. Their lugs are high and closely spaced to provide firm anchorage in concrete, to help prevent cracking. And Bethlehem Bars are carefully fabricated—cut, bent and tagged—in our own shops to meet the exact specifications of your job.

Bethlehem operates shops equipped to fabricate reinforcing bars at Boston, Elizabeth, N. J., Philadelphia, Johnstown, Pa., Sparrows Point, Md., Lackawanna, N. Y., Clearing, Ill., and St. Paul, Minn. If you would like more information about our fabricating service, call the nearest Bethlehem sales office, or write us at Bethlehem, Pa.

Fifteen tons of Bethlehem Reinforcing Bars—bundled, tagged, and with bar lists included—leave the Philadelphia Fabricating Shop for the job-site.

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BETHLEHEM STEEL

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The FILOTECNICA
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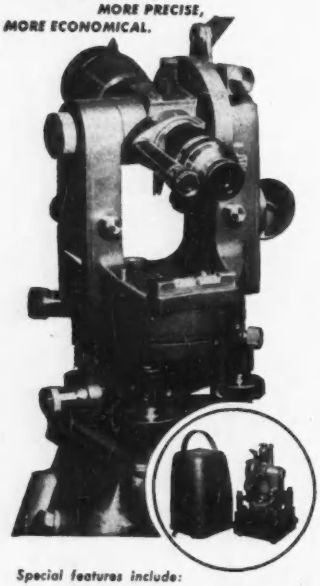
MORE RAPID,
MORE PRECISE,
MORE ECONOMICAL.



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ENGINEERING NEWS-RECORD

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Volume 148 JANUARY 3, 1952 No. 1

WALDO G. BOWMAN
Editor

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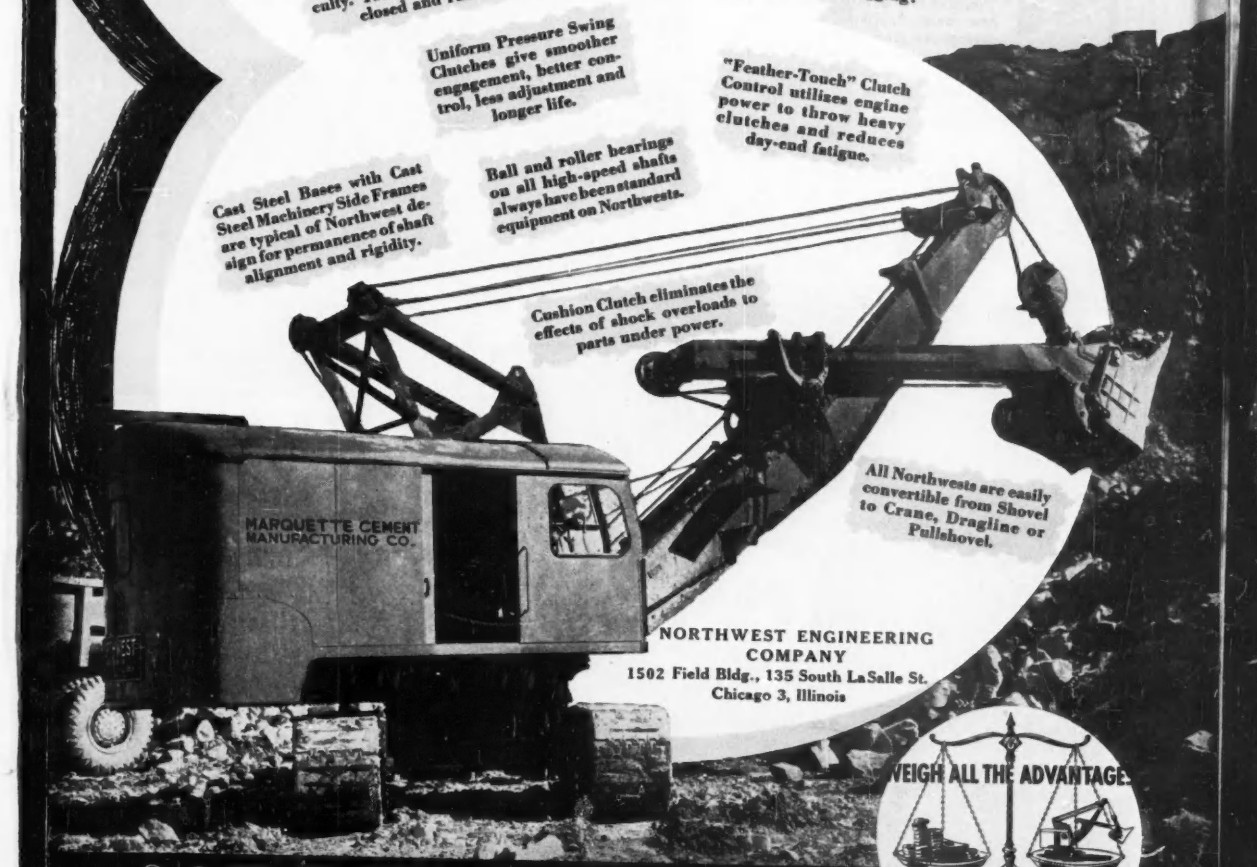

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To fulfill its tremendous task of building engines and other aircraft components for defense and civilian needs, United Aircraft Corporation is in an almost continuous state of expansion.

An addition to the power house at the main plant in East Hartford (below) has recently been completed. The $12,000,000 Andrew Willgoos Turbine Laboratory was finished and put in operation on jet research in the past year. Under construction are new plant facilities at the Pratt & Whitney Aircraft Division in North Haven, and the Hamilton Standard Division in Windsor Locks, Conn.

When it comes to plant operation, United Aircraft is right down to earth. To make sure of lasting efficiency and low maintenance in fluid control, they chose Jenkins Valves for all of these new buildings. At the right is a typical valve station in the vast network of piping at the Willgoos Laboratory.

Long a leader in the development and production of piston engines, notably the famed Wasp, the Pratt & Whitney Division is now a major producer of jet engines like the J-48 Turbo Wasp that powers the Navy's new Grumman Panther, shown above.

To keep plant operating costs down to earth

United Aircraft Corporation relies on

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Despite their *extra* value, proved in every type of service, *you pay no more* for Jenkins Valves. For new installations, for all replacements, let the Jenkins Diamond be your guide to lasting valve economy. Jenkins Bros., 100 Park Ave., New York 17; Jenkins Bros., Ltd., Montreal.

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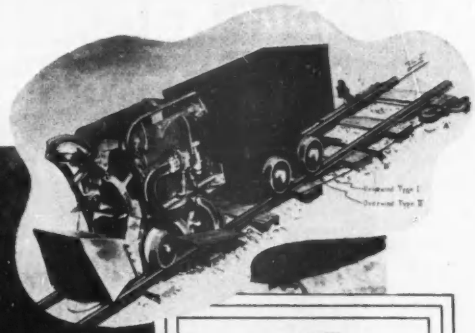
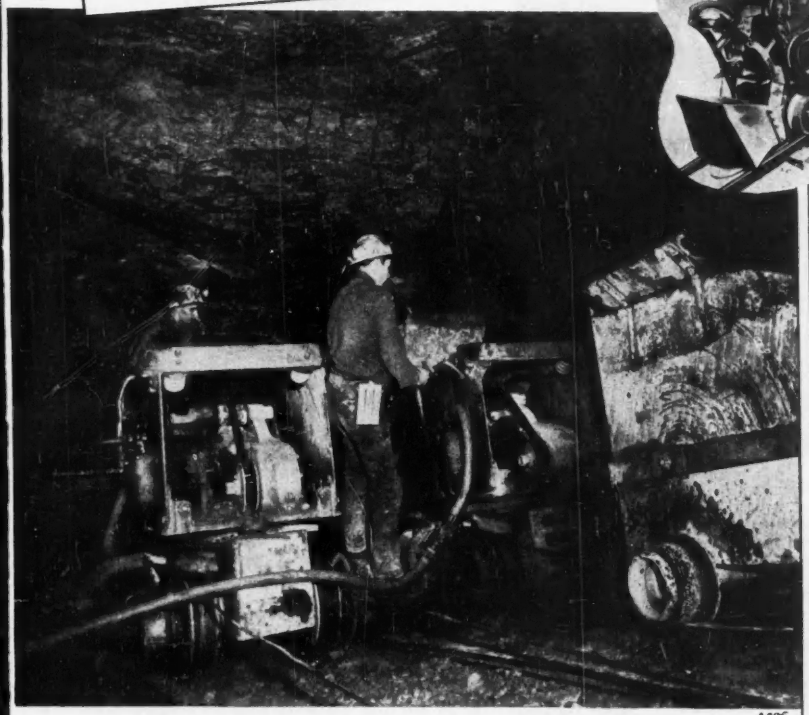
Ophir Unit of the United States Smelting Refining and Mining Company, Ophir, Utah, 26° slope, 1450' length, size 8' x 12'





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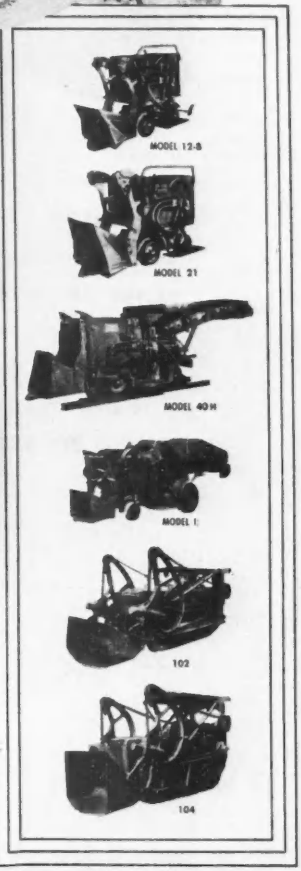

Sinking incline shafts from the surface or from one level to another is a difficult undertaking for any crew.

Mining companies as well as contractors have found that using an Eimco "Slope-Loading" RockerShovel does speed-up the mucking cycle by 300% to 400% and have standardized on this type of equipment.

Slope Loaders work on slopes to 30° from horizontal and have the advantage of wide clean-up, fast digging and loading, with easy operation in all positions.

Eimco Slope Loaders can be easily converted to tunnel loading machines when the incline is completed.

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...writes
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PORTABLE
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FASTER COMPACTION
BETTER COMPACTION
LOWER INITIAL COST
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EASY TO USE, SAFE!

"THE engineers picked an area with a clay material on which no one had been able to get satisfactory compaction without bringing in select material to mix with the clay," writes G. L. "Bud" Plant, Salt Lake City contractor, in reporting on current construction of an ordnance proving ground in Utah. He continues, "To make a long story short, the 10" lift with two passes was 97.5% compaction . . . *your rammer is the answer to a contractor's prayer* . . . we are putting in an average of about 200 cubic yards (compacted measure) per 9-hour shift per rammer."

If you are not already using the Barco Rammer for soil compaction work, find out about it today! Ask for the nearest Barco Distributor to give you a demonstration. Catalog and information on request. *Worldwide Sales and Service.* BARCO MANUFACTURING COMPANY, 1814B Winnemac Ave., Chicago 40, Illinois. *In Canada:* The Holden Co., Ltd., Montreal, Canada.

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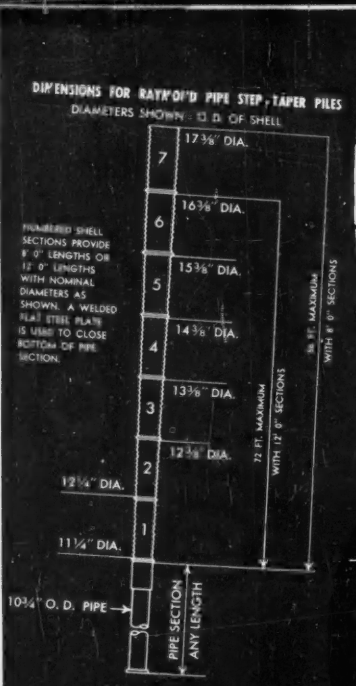

Raymond

MAKES 5 TYPES OF CONCRETE PILES

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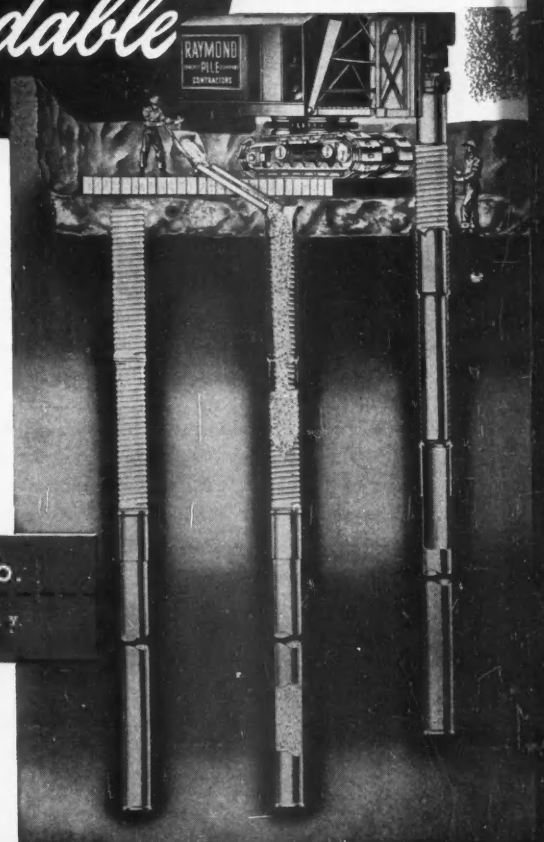
4. COMPOSITE . . . 5. GOW CAISSONS

Raymond installs every type of pile: cast-in-place concrete, precast concrete, steel pipe, wood and H-beam. Raymond operations include underpinning, borings and soil investigations, waterfront construction and harbor and river improvements, shipbuilding facilities, also cement-mortar lining of water, oil, gas and chemical pipelines, 4" to 144" diameters, by Centriline Corporation, a Raymond subsidiary.

3. PIPE STEP-TAPER PILES

Deep and Dependable

At the right, the pipe step-taper pile is being driven with the rigid steel mandrel. In the center the shell and pipe are being filled with concrete after having been driven to satisfactory resistance and inspected. At the left is a completed pipe step-taper pile.



Raymond Pipe Step-Taper Piles are composed of an upper section of Step-Taper Shell Pile and a lower section of closed-end steel pipe pile. These piles are generally used to penetrate thick beds of soft soil to reach hard bottom at depths as great as 150 feet or more. The pipe step-taper pile is a most dependable pile available for reaching hard ground at great depths.

Raymond's methods result in efficiencies and substantial savings that are well worth investigating. Consult our engineers for more detailed information.

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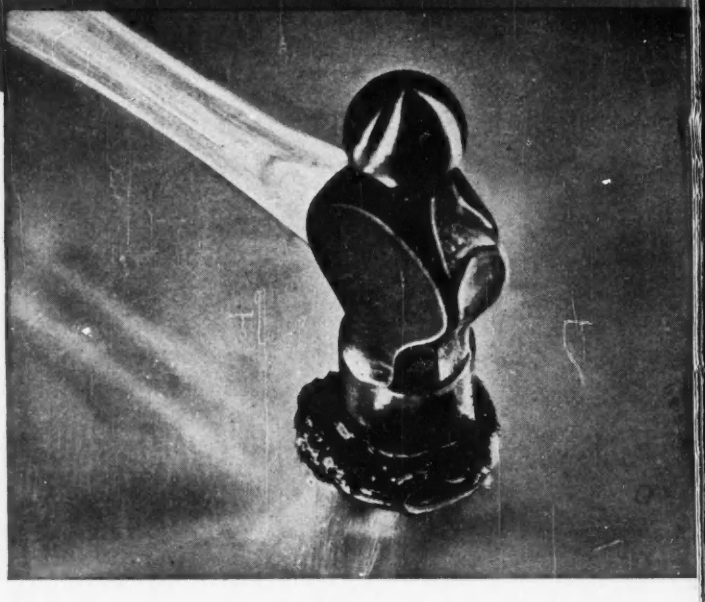

HAMMER TEST: Put a lump of *Texaco Marfak* about the size of a walnut on a smooth, solid surface. Then hit it as hard as you can with a good-sized hammer. See how *Texaco Marfak* cushions your blow, does not splatter. That's because *Texaco Marfak* is both adhesive and cohesive. It clings to the surface and *holds together* — a dramatic demonstration of how it stays in the bearings and protects chassis parts under the pounding of the roughest service.

See why chassis parts last longer with TEXACO MARFAK

Make the famous *Texaco Marfak* "Hammer Test" as described above. Note how *Texaco Marfak* cushions your hardest blows. The wonderful cohesive properties of *Texaco Marfak* prevent it from splattering like ordinary grease.

So it is in your chassis bearings. *Texaco Marfak* withstands the poundings of roughest roads . . . stays in the bearings for extra hundreds of miles . . . seals out dirt and moisture. *Texaco Marfak* stretches parts life because its tough, tenacious lubricating film gives better and longer lasting protection against wear and rust. Your maintenance dollars go farther.

In wheel bearings, use *Texaco Marfak Heavy Duty*. It seals itself in, seals out dirt and moisture for longer lasting protection. Will not leak onto brakes. No seasonal change required.

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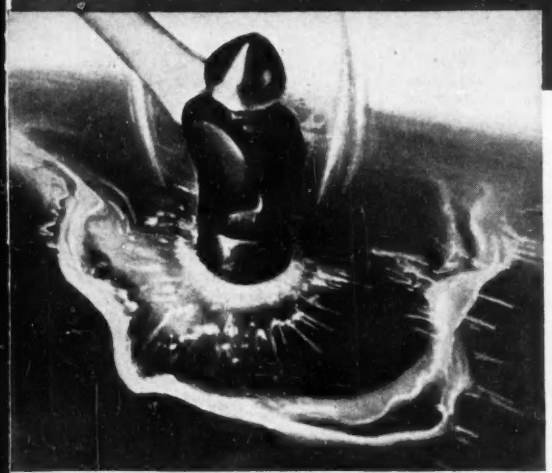

TRY the "hammer test" with ordinary grease. Stand back and hit it! Note how it splatters, fails to hold together — proof that ordinary grease soon pounds out of chassis parts, leaves them unprotected, shortens their life. Fleet owners everywhere agree that *Texaco Marfak* gives the best protection under all conditions.

*Oil X***. Fully detergent and dispersive, this oil keeps engines clean, assures full power, less fuel consumption, lower maintenance costs.

Protect crawler track mechanisms with *Texaco Track Roll Lubricant.* It guards against moisture, dirt and wear under all operating conditions.

Let a Texaco Lubrication Engineer help you simplify your maintenance lubrication . . . keep your equipment on the job and out of the repair shop. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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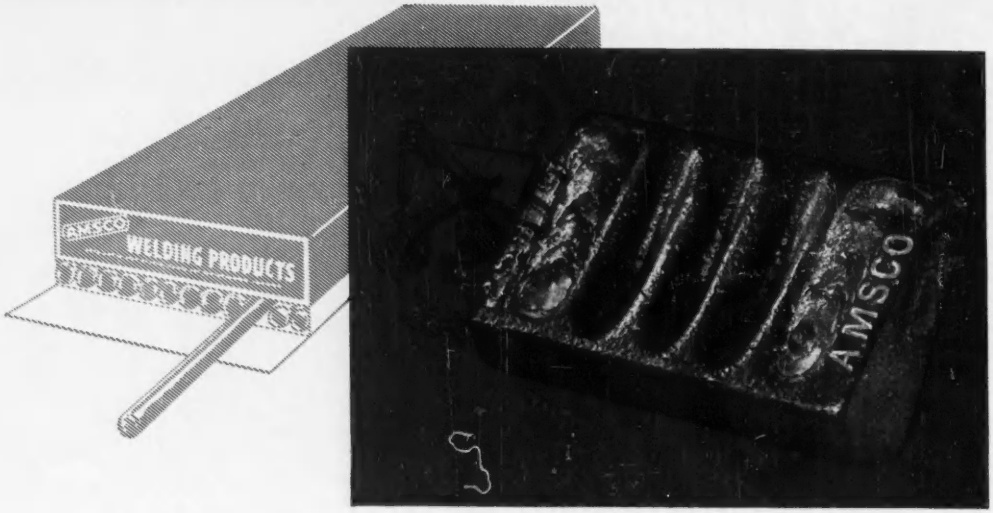

NOW! Wear your point and have it too!

This new catalog can help you save money on repair costs . . .

It's packed with information on the new "Wear-Sharp"—and the entire AMSCO Weldment line. Complete with installation instructions and helpful hints on welding. Be sure to ask for your free copy.

AMSCO "Wear-Sharps" are available in two quickly and easily installed types:

Crescent Back
For application to worn tooth with minimum fitting.

Straight Back
For application after worn tooth is beveled.

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New AMSCO "Wear-Sharp" repointer holds a straight edge as it wears . . . and stays sharp longer!

Here's a new tooth repointer that is just what you've been looking for . . . the AMSCO "Wear-Sharp", *and it does exactly what the name implies.*

Note the groove design on this new repointer shown above. The outside and end grooves are AMSCOATED with Amsco Hardfacing Electrodes specially recommended for this purpose, while the inner grooves are left as they are. Result?

The Amscoated grooves wear slower, thus equalizing wear along the entire cutting edge and making the point stay sharp longer. Rounded, blunted corners that cut digging efficiency and waste power are completely eliminated for the life of the repointer!

The "Wear-Sharp" is already setting new records in service life and digging efficiency. For example, an Eastern mine reports *6 times longer service than any repointer ever used before.*

The next time your dipper teeth need repointing, try the new "Wear-Sharp"! Write today for illustrated catalog shown at left—and name of your nearest AMSCO Distributor.

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Brake Shoe **AMERICAN MANGANESE STEEL DIVISION**
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The 35-ton Plymouth Locomotive shown above has been in operation for six years at Martinsburg, West Virginia, hauling lime and crushed stone from quarry to crushing plant of the Blair Limestone Division, Jones and Laughlin Steel Corporation.

"Our Plymouth hauls 13 loaded cars or 30 empty cars over curving, narrow-gauge track, up and down a 3½% grade," reports T. J. McCarthy, General Superintendent. "What's needed for this big task is *power*—and Plymouth provides plenty of it, always available at a minute's notice!"

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The test of time has proven Lock Joint Concrete Pressure Pipe lines to be extremely economical to operate, requiring practically no maintenance or repairs throughout an estimated useful life of more than 100 years. Yet the pipe is amazingly low in initial cost.

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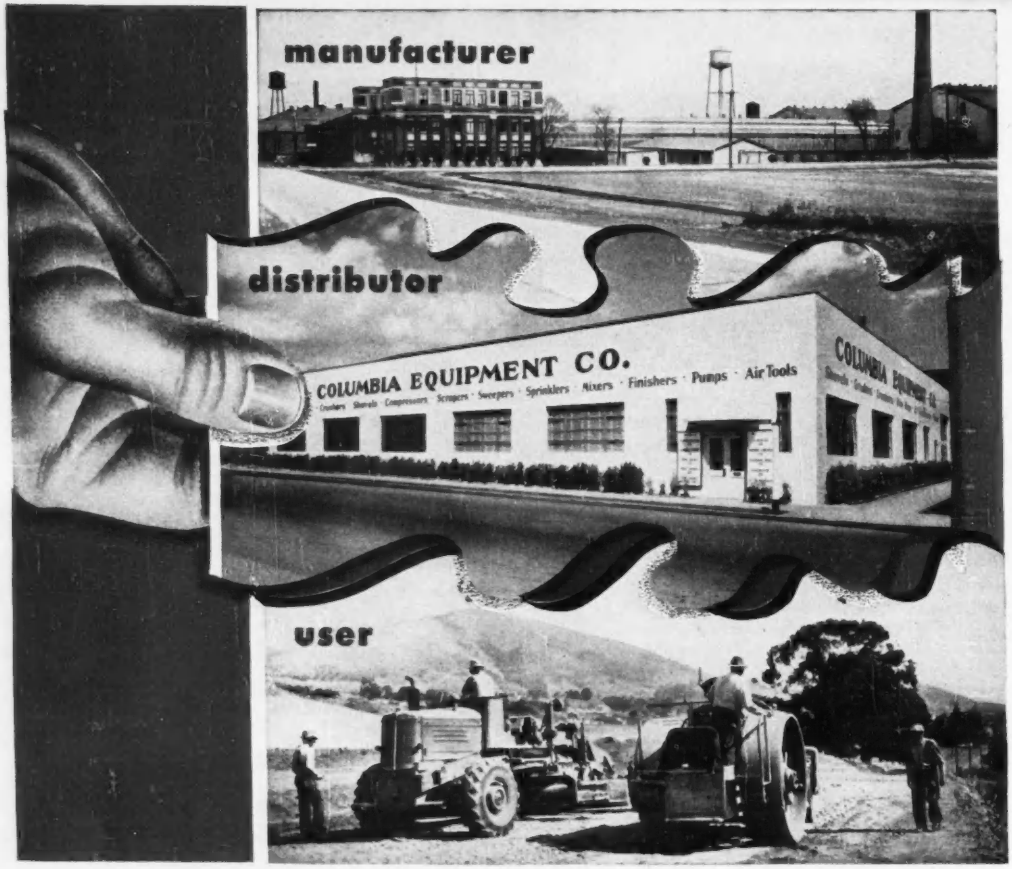
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VOLUME TO GO DOWN—BUT BACKLOG BUILDS UP

Construction will be almost unique among U. S. industries this year. Its volume of work put in place will be held below last year's by government controls—while almost every other major industrial group will produce more in 1952.

But this is certainly no disaster for the construction industry. 1952 will still be one of the biggest building years on record. And work that is held up now will make demand for future construction—already huge—even greater.

Defense and industrial expansion programs are behind this outlook. They boost production in factories, on farms, in the mines. They also boost construction of industrial plants and defense facilities. But defense takes away more from construction than it adds, by cutting the supply of metals available for work on anything but defense projects. Makers of consumers durable goods are about the only people in exactly the same fix as contractors.

• **This Year**—Here's how 1952 production shapes up.

Makers of industrial equipment, other heavy durable goods and the metals that go into them face a very big year. Defense spending will be rising, from an annual rate of about $45 billion now to a rate of perhaps $60 billion by next December. Most of the increase will go for tanks, planes and other durable items. And industry's spending for new machines will run at a record rate in the first half of the year, may stay high throughout.

Production of consumers goods will be up for some industries, down for others. Metals shortages will hold down output of consumers durables—TV sets, refrigerators and the like—perhaps to 75% or less of 1951 totals. But output of soft goods like food and clothing is expected to rise—because consumers will have some $12-$15 billion more in income to spend this year.

Farm output will be up, too, if weather is good enough. With prices of farm products high, farmers will produce as much as possible.

Most extractive industries—oil, coal, chemicals, metal ores—will be running full blast. High-level industrial production will eat up all that most of these industries can produce.

But construction is another matter. Total public construction will be up by 14%-15%. But the drop in housing and commercial building—caused by shortages of materials—may be enough to take total construction as much as 10% below the 1951 level. Just how big this cutback will be depends mainly on copper supplies. Any increase in military requirements for copper would bring a bigger drop in building. Right now, it looks as if copper will be very scarce.

• **The Future**—All this means that defense holds back construction, helps others.

But contractors can take consolation from this: Work that cannot be done now will make future demand for construction even greater.

Present needs for construction are huge. The ENR backlog figure of $61.7 billion gives an idea of what is needed. And construction needs are growing so fast that actual building can't keep pace. Last year the backlog increased by almost $10 billion, even though builders set a new record for work put in place.

Actual needs are vastly greater than these figures show. The ENR backlog includes only projects on which some planning has been done and some money spent. Some estimates of U. S. needs for new roads and highways alone are bigger than the entire backlog for all work.

These needs will still be there—waiting to be satisfied—after the defense program slows down. And needs are growing all the time under pressure of steady growth in the U. S. population. Population has increased an estimated 4.5 million in just 21 months since the last Census. It will take more billions of dollars in new construction to provide the homes, streets, stores and other facilities the bigger populace will need.

Gotham Cheers!

10 DAYS SAVED IN REPAVING KEY SECTIONS OF HENRY HUDSON PARKWAY

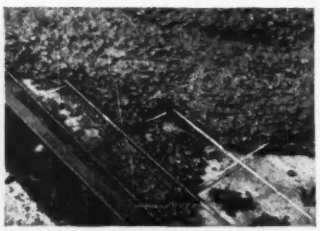
● Repaving this key section of Henry Hudson Parkway's northbound lane illustrates how good job planning minimizes traffic interference. Using 'INCOR' AIR-ENTRAINING 24-HOUR CEMENT for the dual advantage of increased workability and durability, plus dependable 24-hour service strength, heavy traffic was maintained through the job at all times. And the handsome new 'Incor' roadway was in full use ten days ahead of schedule! Good example of modern efficiency in highway building and ready-mix service, as well as of this clear-cut fact:

When you want to beat a record, without sacrificing quality, you can't beat 'Incor'*, America's FIRST High-early-strength Air-entraining Portland Cement.

*Reg. U. S. Pat. Off.

ANOTHER EXAMPLE OF DUAL ADVANTAGE OF 'INCOR' AIR-ENTRAINING 24-HOUR CEMENT

Traffic used 3 lanes, while 2" asphalt topping and 3" of old concrete base were dug out and two westerly lanes concreted.



All hands remarked at the cohesive, highly-plastic quality of the 3½" slump 'Incor' air-entrained concrete.

Finishing followed closely behind the mixer —highly-plastic 'Incor' mix expedited placing and finishing.

The first two lanes were quickly opened to traffic, as work went ahead at top speed on the next two lanes.

Completed 10 days ahead of time—result of paving know-how, on-time ready-mix service, and typical 'Incor' performance.

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EDITORIALS

Basis for a New Year resolution

IN HIS "PRESIDENT'S MESSAGE" for a recent issue of the New York Professional Engineer, Charles B. Molineaux had this to say about the unification plans now being considered by the engineering profession:

"The question for us is, are we really concerned with unification or are we really more interested in who heads unification? For my part I believe that unification under any proper and dignified plan should be our real aim. We should never compromise on principle, but we can most certainly compromise on the matter of who heads unification or who achieves some personal distinction through it."

If everyone could approach the subject of planning for closer integration of the overall activities of the engineering profession in that spirit, real progress in the year ahead would be assured.

Prescription for progress

THE BUILDING INDUSTRY as one of the largest recipients of the fruits of research, should be vitally interested in a recent analysis of the situation by Karl T. Compton, chairman of the Corporation of the Massachusetts Institute of Technology. Wise handling of three things is needed, said Dr. Compton, if the nation is to continue to enjoy the benefits that research and development can create for it—technical manpower, adequate facilities and a free enterprise environment. None of these is more important than any of the others, but the importance of research facilities is perhaps the least understood.

It is Dr. Compton's opinion—backed by more experience than almost any other American—that these facilities can only be assured if private industry and educational institutions are encouraged to undertake all of the research and development work that they are capable of. This can be done safely and economically if two practices are followed: (1) Keep government research laboratories to a minimum, to avoid unproductive investment and the draining off of technical manpower by a scientific bureaucracy; (2) put government research planning and control in the hands of a competent board with authority to guide Congress away from ill-considered appropriations for research from its public works funds.

In making these recommendations Dr. Compton was addressing an audience come to witness the presentation of the bienniel Chemical Award sponsored by McGraw-Hill's magazine, Chemical Engineering. Made this year to the Phillips Petroleum Company, it honored that company's successful efforts to develop high-abrasion carbon black and cold rubber, which promise such lasting benefits as 50% more mileage in tires and less dependence on imported rubber. Nearly a half of Phillips' 4,000 employees are engineers, its research facilities are huge and the environment of our free enterprise system has permitted it to accumulate the necessary funds to operate them. Only if these conditions can be assured for hundreds of American concerns can such benefits be counted upon regularly as a motive force for our prosperity. Dr. Compton's prescription for progress is one that can and should be taken in large and frequent doses.

Death and the dollar sign

DEATH CAME SWIFTLY to five young Marines, homebound for the holidays, on the newly opened New Jersey Turnpike Dec. 15. Traveling at what the police said must have been terrific speed, their car ran into the rear of a trailer-truck combination.

It would almost seem as though the first fatal accident on New Jersey's great super highway had taken this tragic form to emphasize the lessons taught by the accident record of the Pennsylvania Turnpike—that no highway can be made safe against excessive speed; that safety can be obtained only at the high cost of adequate police supervision.

Designed to be safer than any highway built previously, the Pennsylvania Turnpike has had an appallingly high fatal accident record in the ten years since it was put into service. It is the claim of the users of that turnpike that this situation is due to the higher speeds that are permitted—70 mph for passenger cars and (until recently) 60 mph for commercial vehicles—and to inadequate supervision by police to see that even those speeds are not exceeded. The relatively good accident record of the Long Island State Parkway system, where top speeds are limited to 40 mph and are rigidly enforced, adds support to that claim.

Supervision of that kind, however, runs up the operating costs of any highway. On a toll turnpike it could mark the difference between profitable and unprofitable operation.

That inescapable conclusion gives special significance to this first accident on the New Jersey Turnpike. Presumably no amount of police supervision can completely eliminate such accidents. But the number can be reduced by adequate police supervision, and especially by building up public recognition of the fact that toll highways are not speedways.

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Of course, reinforcing bars are a Class A Product; so it is essential that we receive an allotment from you, well in advance of delivery, in order to take care of your requirements promptly and completely.

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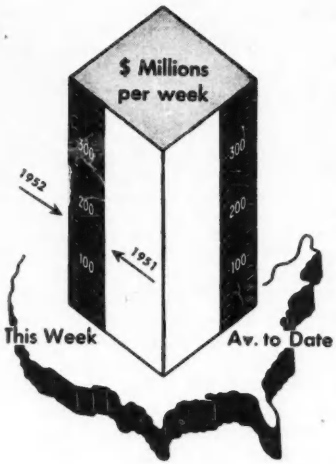
THE CONSTRUCTION WEEK

MORE WATER FOR BALTIMORE—Like New York, Baltimore is looking for future water sources and has appointed a special group of experts to do the hunting. According to Paul L. Holland, public works director, even the water supply dam across the Patapasco River, with completion expected in 1955, will not meet Baltimore's long-range water supply needs. It will boost daily yield to 242 mg, but that's not enough for the anticipated demand. The experts picked to advise the city are Abel Wolman of John Hopkins University and head of the group Harry B. Shaw, Washington Suburban Sanitary Commission and G. J. Requardt of Whitman, Requardt & Associates of Baltimore.

TEST LOOMS—The Corps of Engineers system of permitting alternate bids on contractor developed substitute designs will get an acid test Jan. 10. Bids will be open then for $25 million of permanent troop housing at Fort Ord near Monterey, Calif. Some of this will be for roads and sanitary facilities that can be bid separately but about $18 million will cover buildings on which alternate designs are permitted. More than 40 contractors took out plans before Christmas. Bidding will almost surely be on a joint venture basis.

NO ACTION YET—On Jan. 9, the Construction Industry Advisory Committee will meet with officials of the National Production Authority. One of the big questions it will ask is what became of the action requested last month (ENR Dec. 13, p. 28) by the New York Building Congress. Further, this committee has called a luncheon meeting of its own Feb. 12—in spite of NPA regulations that do not allow a committee to meet except when its NPA chairman calls it together. Even so, the committee has invited Defense Mobilizer Charles E. Wilson to attend. He probably will go.

REPRIEVE—The 170-man wage policy board of the CIO United Steelworkers of America meets in Atlantic City this week to vote on acceptance of President Truman's steel peace plan. There is little doubt they will accept and continue working while the Wage Stabilization Board starts hearings next week on their wage demands. Meanwhile Economic Stabilization Chief Roger Putnam has publicly stated what price stabilizers have been saying privately for a long time—the steel industry is not entitled to any price increases, even under the Capehart amendment.



Contracts by type of work

	This Week	1951	% chge
Waterworks	$10.0	$2.6	+285
Sewerage	4.7	7.0	−33
Bridges	5.8	12.3	−53
Highways	19.2	10.3	+86
Earthwork, Waterways	4.1	3.5	+17
Buildings:			
Public	32.5	23.4	+39
Housg., pub.	4.4	27.2	−84
Housg., priv.	21.0	14.2	+48
Commercial	4.6	29.8	−84
Industrial	39.1	16.6	+135
Unclassified	13.7	7.3	+88
Total	**$159.1**	**$154.2**	**+3**

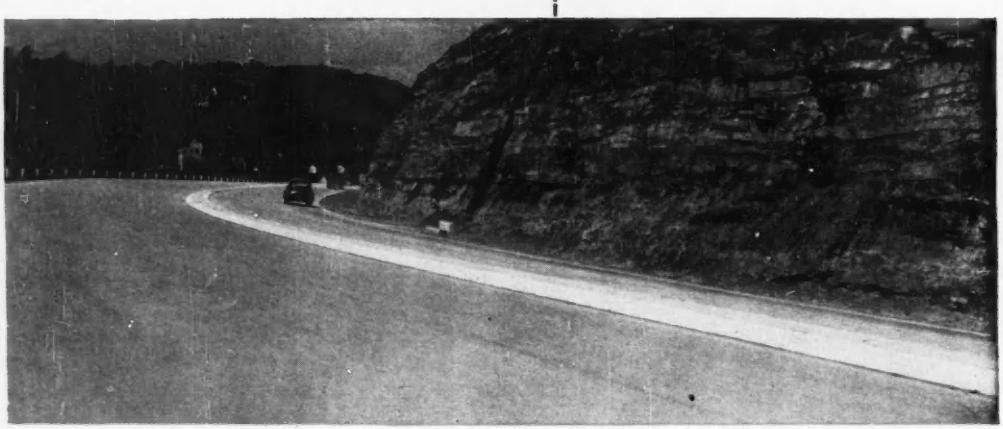
NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

ENR COST INDEX

Index Base = 100	1913	1926	1949
Constr. Cost. Dec. '51	547.67	263.26	114.81
Bldg. Cost... Dec. '51	405.58	219.24	115.29
Volume ....Nov. '51	404	164	117

IN THIS ISSUE—After breaking many record peaks last year, the construction industry faces another year of big building in 1952 (p. 23) . . . With Congress opening another session, here is the major legislation affecting construction on the agenda (p. 24) . . . The New Year rang in the centennial observance of engineering (p. 25) . . . Contractors are finding scrap salvage good business (p. 26) . . . State legislative sessions this year will spur building (p. 27) . . . Prestressed concrete construction saves steel (p. 28) . . . 480-ft span for Chesapeake Bay Bridge breaks loose (p. 29) . . . Unique production line tests give prefabs a rough time (p. 30) . . . One housing authority finds concrete construction cheaper (p. 35) . . . It takes a lot of money to build McNary Dam (p. 40) . . . A master plan is announced for Columbus, Ohio (p. 49).

This highway was "winterized" when it was built —with DURAPLASTIC



Section of highway in Allegheny County, Pa., near Pittsburgh, built with Duraplastic. White concrete reflecting curbs made with Atlas White Duraplastic. Designed by Pennsylvania State Highway Dept. General contractor: Harrison Construction Company, Pittsburgh; paving sub-contractor: McCrady Construction Company, Pittsburgh; White curb installed by E. Arthur James, Johnstown, Pa.

Come freeze or thaw or de-icing salt, this section of highway near Pittsburgh is ready for the winter's worst, because the concrete was made with Atlas Duraplastic air-entraining portland cement.

Duraplastic makes more durable concrete because it minimizes segregation and bleeding. Thus, concrete is fortified against the effects of freezing-thawing weather and the scaling action of de-icing salts.

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Awards hit all-time high; defense needs push industry

Called upon to shift from civilian to defense construction during a year of "build-up," the construction industry, as reported by ENGINEERING NEWS-RECORD, surged to an all-time high in dollar value, reaching a total of $13,605 million. This was 10% above 1950's boom level.

In real volume, even taking the air out of inflated dollars, the 1951 contract award volume was 3% over 1950 and only 8% above 1942, which was the peak year for the World War II build-up and the biggest single year (in real volume) on the books. This made 1951 the biggest year in history for the industry.

The demands of a defense economy put a heavy-handed emphasis on private industrial construction, which soared to new heights, climbing 145% above 1950. Contract awards for this category stacked up to a total of $4,124 million for the year. The previous record was $1,683 million.

Unclassified construction, with a total of $1,617 million in contract awards for the year, finished 1951 a healthy 29% ahead of 1950. The big boost in unclassified construction for the year was due mainly to federal airport and airport facilities construction.

Tight steel allocations in the fourth quarter cramped construction of pipelines, and as the federal airport program came down to earth, unclassified construction declined sharply in the last three months of the year.

• **Down, but not out**—Real estate credit controls, restrictive material allocations and a temporary scarcity of mortgage money early in the year worked together to hold private housing awards to $2,032 million.

This was 35% under the previous year, but 1950 was an unparalleled boom year for private housing. Home builders, even with their hands theoretically tied by controls, still came within 8% of the 1949 total. Housing awards showed new life in the fourth quarter when the total rose 11% over the first quarter (which had been the best part of the year).

Commercial construction was the weak link in the chain—the one category that apparently had to be bypassed when critical materials, steel, copper and aluminum, were being allocated by the National Production Authority.

Non-residential commercial construction awards added up to $600 million, 38% under 1950.

• **Other categories** — Waterworks awards totaled $209 million, 3% under 1950; sewerage contracts added up to $335 million, 16% over 1950; highways and bridges, with a total of $1,483 million, were down 10%.

Earthwork, irrigation and drainage awards, totaling $504 million, were 21% ahead of 1950. In the public building category, public housing, with a total of $644 million zoomed 79% ahead of 1950, while non-residential public building totaled $2,057 million, down 14%.

If rising costs, steel, copper and aluminum shortages and government controls were clouds on the horizon in 1951, there was also some sunshine.

So big that it seemed to be the sun itself was the backlog of work to be done. As shown in the accompanying chart, the backlog had made a spectacular climb up to Dec. 1.

Last-minute ENGINEERING NEWS-RECORD figures through the end of December show how projects have piled up. The total backlog, as of Jan. 1, 1952, now stands at $62.15 billion—up 19% in one year.

• **More build-up to come**—With the defense economy still building up, with plants becoming obsolete, with the normal loss of established plant through fire, flood and other disaster, and with money flowing freely, American businessmen were staking out specific industrial projects to be built whenever the National Production Authority gives the go-ahead.

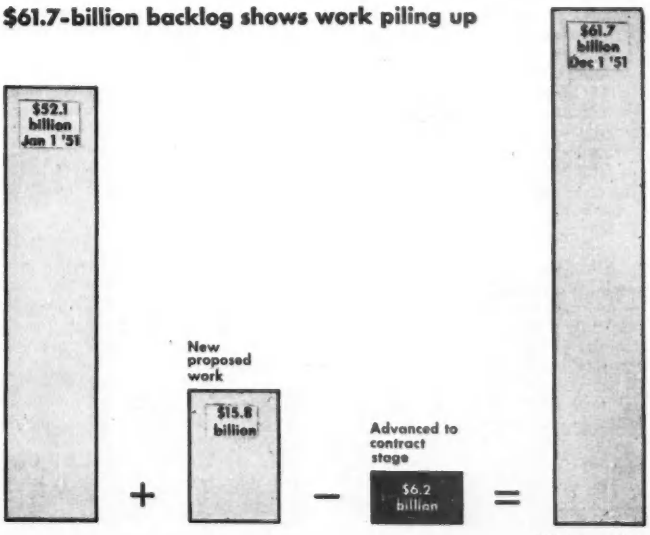
Because of this, the backlog of industrial construction hammered out a 58% increase during 1951—at a time when awards for industrial construction were climbing to the highest dollar total in history.

Although industrial stole the show in backlog gain, every other category was up on the same basis.

Unclassified construction showed a 25% gain in the backlog; commercial, 15%; public buildings, 11%; highways and bridges, 13%; sewerage, 8%; earthwork and drainage, 2%, and waterworks, 2%.

The record would seem to show that for the construction industry, 1951 was one of its most difficult—and one of its most productive years.

$61.7-billion backlog shows work piling up



ENR Business News

New congressional session to launch more construction for defense build-up

WASHINGTON—National defense, inflation and next November's elections will pose conflicting problems for Congress when it comes back to Washington next week. Congressmen will weigh all three of those major factors carefully in deciding how to vote on every bill—including a score that have special importance for construction.

Biggest issues before the Congress will be the defense build-up and the controls that go along with it. There is no disposition to back down on the arms program. Quite the reverse is indicated: Congress will vote the funds to expand the Air Force, build more atomic weapons plants.

Controls likewise will be continued. When the Defense Production Act comes up for another year's extension, Congress may further curtail Truman's powers, but it will re-enact the basic law under which the executive branch now controls materials, prices and credit. The controls may be modified during the course of the year, but they will continue to govern a big part of the construction market.

Economy will have less chances than usual in an election year. President Truman is expected to submit a budget totaling about $77 billion for fiscal 1953. Only $20 billion of it will be for non-defense purposes.

Included in the defense budget will be a sizable sum, estimated at about $3.2 billion, for military construction. Most of that money would be for Air Force bases, the remainder for Army and Navy projects.

During the session, Congress also will have to decide on the size and character of a proposed atomic energy expansion program. The Atomic Energy Commission and the Defense Department are submitting this week a joint report evaluating the possibilities. Several alternate plans have been studied. Congress may authorize a program for some $5 billion of new atomic weapons installations.

Economy and national needs will pull in opposite directions, when Congress takes up at this session the federal-aid highway authorization bill for fiscal 1954 and 1955. The American Association of State Highway Officials will advocate an increase in federal aid to $810 million a year. Other organizations will undoubtedly support similar recommendations. But Congress, looking at arms expenditures, is more likely to hold the authorization to about the present level of $500 million a year.

Appropriations for other federal-aid programs, such as hospitals and airports, will probably continue at about the same rate as this year. Similarly, the money voted for federal construction of flood control, navigation and reclamation projects is expected to be not much different from the sums which have been approved for the currrent fiscal year.

• **Water policy**—Proposed basic legislation for a national policy on water resources should reach Congress at this session. The President's Water Resources Policy Commission drafted a bill early in the year. Since then, the Budget Bureau has been working on it in cooperation with many organizations in the water resources field. Truman is expected to send the final draft to the Hill in the next few months.

Fundamental questions will be raised by the water policy legislation. In keeping with congressional custom in election years, the present Congress is expected to leave the issues for decision by later bodies.

Similarly, the present Congress is not expected to take any final action on pending bills to control rainmaking activities, set up valley authorities or reorganize the Interior Department. But it will take some action on several project bills.

Both House and Senate committees have held hearings on bills to authorize the Niagara River hydroelectric project. Separate bills offer different approaches to development on Niagara Falls power—by the federal government, by New York state or by private power companies. The committees are expected to report a bill or bills at this session, but prospects of congressional enactment are not expected to be bright.

Interest in the St. Lawrence project has been stimulated by Canada's threat to build the seaway on her own. Committee changes may make it possible to report a bill for a House vote at this session. But chances of congressional approval are still slim. Cheatham Dam on the Cumberland River may be authorized at this session. The Senate already has approved the project.

Congressmen will have an eye on the calendar from the day the session begins, Jan. 8. They would like to adjourn by early July, before the party conventions. However, they probably will have to take a recess from unfinished business at that time and come back to Washington for a clean-up afterward.

New year spurs plans for state highways

State governments last week were busy making highway plans. New turnpikes and extensive improvement programs were the major topics for both discussion and legislation.

In brief, here is the picture:

• **Illinois**—Plans to spend $100 million on highway construction were announced by Charles P. Casey, state director of public works and buildings. If carried out, the program will set a new record for road building in the state. The scheduled expenditure does not include work needed to extend the primary system in cities or to improve federal secondary roads. And it does not include about $20.5 million in projects carried over from 1951.

• **Pennsylvania**—Final passage was given a bill authorizing an extension of the Pennsylvania Turnpike from a point west of the Susquehanna River to the Maryland State line where it would link with an expressway to Washington. The extension is also expected to swing toward the outskirts of Baltimore, Maryland. The Pennsylvania House of Representatives voted last week, 112 to 25, in favor of the bill.

• **Minnesota**—State Highway Department announced more than $40 million worth of road improvements were placed under contract during 1951. The total figure includes both the state highway program and county-federal contracts. But the record expenditure in the state represents only about one-seventeenth of the $552-million backlog of construction projects considered necessary by the state highway department.

• **Colorado**—State Governor Dan Thornton has approved a record $28.9-million state highway department budget for 1952. Actual highway construction will have $20.8 million. Over two thirds of this figure is destined for federal primary and secondary aid projects, and the rest for state projects. Another $3.5 million in addition to the budget total will be available in federal funds for construction of access roads in the uranium mining area of southwest Colorado and to defense facilities.

• **Maine**—Executive Director William B. Getchell of the Maine Turnpike Authority announced that negotiations are underway for an on-the-ground survey for an extension of the toll super-highway located north of Portland.

MAJOR LENOX R. LOHR

CARLTON S. PROCTOR

Engineering's centennial year begins

CHICAGO—With the ringing of the bells that marked the end of 1951 and the start of 1952, the American Society of Civil Engineers entered its centennial year. And the entire profession of engineering began to implement plans to join the venerable—but exceedingly spry—ASCE in marking a major anniversary in the history of the United States.

The year-long observance—to reach a climax with a convocation of all 49 major engineering societies Sept. 3-13—has one principal purpose: To dramatize for the general public the principles that have produced the leading nation of the world, and to point the way for future development.

Part of that dramatization will show the role of the engineering profession in that growth and personalize the engineer to the public—pull him out of his type-cast part behind his figures and his gadgets and show him to be a human being, a good citizen, a builder for the future.

• **Central location**—Because of its location, the city of Chicago will be the center of the observance.

Base of operations will be Chicago's huge Museum of Science and Industry, where a daily stage production will be presented for the general public from July through September, and where a new and permanent exhibit will be set up to show the profession's progress to an estimated 6 million.

The general program will be centered in the Museum, which includes a number of auditoriums and a 1,000 seat theater. Concurrently the various societies will hold their own conventions in various hotels of the city.

Many foreign delegates will be present, and the U. S. Department of State, through its division of international conferences, is an active participant in the planning.

The convocation planned for September will coincide with ASCE's own session (Sept. 8-12). It will include symposiums, each day, on such subjects as: professional and social development; education and training; transportation; metals and chemical industries; health, and communications.

• **History**—Unprecedented for size and character, the celebration is in some respects a showing of filial affection by all other societies to ASCE, since ASCE is the parent of all major U. S. groups.

Its first meeting—for purposes of organization—was attended by "ten gentlemen who took out membership" in the offices of the then Groton Aqueduct Department, in New York City on a cold Nov. 5, 1852. It began operating (with an attendance of eight) on Dec. 1, 1852, under the leadership of President James Laurie, who held office for nearly 15 years.

Slow growing, the society has finally waxed mightily, to its present membership (as of Dec. 8, 1951) of 33,815 (including juniors, associates, affiliates). The societies of mining engineers, electrical engineers and others broke off from the parent body in later years as specialization advanced.

• **Planning**—So when ASCE early in 1950 appointed a committee to plan its own observance (Malcolm Pirnie, Irving V. A. Huie, R. E. Daugherty, E. E. Howard, Gail Hathaway, Carlton Proctor, Ralph Budd), the cooperation of other founder societies, and all engineering groups, was enlisted.

Backed by a drawing fund of $17,000 from ASCE (which has also provided $42,000 for its own observance), a non-profit corporation, Centennial of Engineering, Inc., was formed with Lenox R. Lohr as president.

This corporation (ENR Sept. 27, 1951, p. 27) has carried on the planning work since that time. Mr. Lohr, now president of the Museum of Science and Industry, is a civil engineer, and has directed the Chicago Century of Progress exposition and the recent Chicago railroad fair. He is assisted by Carlton S. Proctor (ASCE President) as corporation vice-president; Titus G. LeClair, treasurer, and Frank W. Edwards, general manager.

CHARLES F. KETTERING

FRANK W. EDWARDS

ONE WAY TO GET STEEL—The old Hastings Bridge in St. Paul splashing into the Mississippi, was dismantled for the Minnesota Highway Department by Okes Construction Co., and sold to the Paper Calmenson & Co., metal fabricator. Of the total 450 tons, much will be used again in small bridges, some will be salvaged as scrap. (Wide World photo.)

Contractors push scrap salvage drive

Spencer Construction Co. watched the scrap pile grow on its 16-acre Carrollton, Dallas County, Texas, plant site for more than a decade.

The pile held throw-away and worn-out equipment—old graders, truck hulks, and tractor carcasses, scraps and ancient parts. And it didn't do much for the landscape.

Then came the scrap drive.

"We knew that steel supplies affect our business and we didn't want to contribute to a shortage in construction equipment," says Marvin Loving, secretary-treasurer.

The company called the Liberty Iron & Metal Co. of Dallas and arranged to sell the accumulation as scrap. It amounted to 150 tons. And in return for it, Spencer Construction Co. picked up $3,500—which, says Mr. Loving, is a mighty nice way of getting a yard cleaned up.

• **Widespread activity**—Throughout the construction industry drives are in progress to turn in scrap to keep steel mills producing at capacity.

The steel scrap shortage is acute. The big danger is that unless stocks can be built up, new steel capacity slated to come in 1952 can't be used 100%. Unless the new scrap drive really brings results, Mobilization Chief Charles E. Wilson has warned it will become crucial this winter.

Typical is the recent action by the American Road Builders' Assn., pledging support to a drive started by the American Assn. of State Highway Officials.

The ARBA resolution resolves: "That an immediate survey be undertaken by all state, county, and city highway departments to estimate the approximate tonnage of ferrous and non-ferrous scrap available within the departmental operations, and to encourage the flow of dormant scrap into processing channels, and report this activity to the Bureau of Public Roads."

The Bureau of Public Roads is keeping a careful check on how much scrap is being "generated" in the drive which is not only directed toward collection and disposal of scrap in the operations of highway builders, but also location of dormant scrap along highway rights-of-way.

• **Profit found**—Many contractors, undertaking scrap salvage as a matter of cooperating with the mobilization program, are also finding it good business. Often it results in recovery of money tied up in obsolete machines, and other junk.

At Peter Kiewit Sons Co. in Omaha, a search yielded 40 tons of scrap iron, steel and copper.

"We hauled off everything that we didn't have immediate plans for," explained Yard Manager Lou Danzig. "Everything" included old motors, frayed cable lengths, used channel and angle iron, battered hand tools, rusted nails, nuts, bolts, clamps, reinforcing bars, wire, machinery parts and other odds and ends.

"It was our fourth salvage cleanup this year," Mr. Danzig said, "and brought our 1951 scrap sales to more than 100 tons. It's good business for us. The scrap brings us up to four cents a pound and frees our yard space for storage of equipment and other stocks."

The George M. Eady Co., road highways and general contractors of Louisville, Ky., is another who finds it good business. Said its president: "We used to give away junk—but today we are selling it, not letting it accumulate."

• **Economics**—The push was pointing up some lessons in economics, too.

Said another Louisville firm (Hays & Nicoulin, Inc.): "On most jobs today, we junk all unneeded metals direct from the job, without letting it even go onto our own piles. That means rehandling—and labor costs money. We don't junk reinforcing steel—we've become very conscious of the shortage, and find we can use odd lengths. We're junking over-age stuff and replacing it with new—and find the saving in maintenance costs worth it."

Said an Omaha company (Yant Construction Co.): "At least twice a year we are making a cleanup of our yards, hauling the scrap metal out to make storage space available for equipment and supplies we will use."

H. B. Zachary Co., San Antonio, Texas, searched its shops and yards for scrap and profitably disposed of 250 tons of it, P. D. Jefferies, general superintendent, said.

Another contractor, Colglazier &

BACK INTO CIRCULATION—Oscar Newquist, manager of the Muncie, Ind., Water Works Co., surveyed his stocks and found some cast iron pipe and fitting which had not been used in a long time. He decided to "put it into circulation" again turning it in as part of the scrap metal drive. (Muncie Star photo.)

Hoff, Inc., recently sold about 20 tons of scrap, and Secretary James Colglazier explains that the company has a scrap disposal program during the entire year, and now the firm is making a special effort.

• **Everybody in**—Most construction men are becoming more acutely aware of the direct effect of adequate scrap supplies on the availability of new steel for use in construction and machinery.

U. S. producers have expanded their open-hearth capacity on the basis of using scrap in them directly, and depending less upon iron from blast furnaces.

Thus, the more scrap that becomes available, the more efficiently all of the open hearths will be able to operate.

No figures are yet available on how much scrap current efforts are producing, or how much scrap the construction industry alone is producing. But surveys indicate that sizeable amounts are available—and they can be turned in profitably.

• **Local drive**—George Wible, newly elected president of the Memphis chapter of the Associated General Contractors, took over his office with the promise that "members have agreed to check all yards and equipment" in a drive to turn up more supplies of scrap.

Retiring President Seth Giem set an example by cleaning his yards completely and promising to repeat the process at regular intervals in the future.

• **Ohio drive**—Building and highway contractors are pressing an organized drive to turn dormant scrap metal back into industry.

Steel companies banded together with Vic Luckanovic of Columbus, representative of American Steel and Wire Co., as chairman. Every contractor, engineer, architect in the area is being contacted personally to join in the effort.

The Ohio Contractors Association have joined the Ohio Highway Department in a concerted campaign to turn up scrap. Paul Boyer, of the state highway maintenance division, heads that group.

Among early contributors to the scrap drive were Krause and Pagura, Inc., 40,000 lbs.; and Sturm and Dillard Co., 60,000 lbs. Both are general contractors.

Franklin County, of which Columbus is part, turned up 700 tons of dormant scrap in a three weeks' drive headed by F. H. Bonnet, president of the Buckeye Steel Castings Co.

Fewer state legislatures meet in 1952 but they will spur new construction

Although fewer legislatures will convene during 1952 than last year, they will be asked to vote heavy funds for new construction and improvements.

The heap of measures confronting solons of 16 states in regular budgetary or extended sessions include money for highways, schools, institutions, airports, housing, industrial developments, water supply, and even traffic congestion.

States where these sessions are scheduled are Arizona, California, Colorado, Georgia, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Mississippi, Missouri, New Jersey, New York, Rhode Island, South Carolina and Virginia. Special legislative session also are certain to be called in some states.

With fall elections in the offing, legislatures generally can be expected to be generous with new projects and improvements.

In addition to this, many major issues will be decided by voters through referendum and initiative action. Here is a quick glimpse at what is in store:

• **Highways**—The trend toward added highway-user taxes and bond issuance to finance long-range highway modernization programs will spread further. Adoption of "ton mile" taxes in Idaho and New York has stirred widespread interest and will be widely debated.

More toll highways can be expected to start and those now under construction or completed can be expected to add new extensions and connecting links.

Each new toll highway starts pressure for more of them in a network that is spreading more rapidly each year.

• **Schools**—New and increased state aid for school construction can be expected, as legislatures will make efforts to help reduce the mounting backlog of requirements.

As an indication, Governor John S. Battle of Virginia has announced he plans to ask the 1952 Virginia legislature for $30 million to aid communities in building schools. It will supplement an original appropriation of $45 million made in 1950, making a total of $75 million available over a four year period.

Some states will follow closely the progress of Georgia, Indiana, and Maine with their 1951 authorizations of revenue bond financing to provide state aid for school construction—the bonds to be amortized from rentals paid by local school boards for use of the buildings. This type of financing may spread rapidly.

• **Housing**—With urban redevelopment enabling laws currently effective in 33 states, additional legislation can be expected to facilitate slum clearance and rehabilitation. A vote is scheduled in California next November on a state constitutional amendment for a new $150-million veterans' farm and home loan bond issue.

Filed for consideration in the 1952 Massachusetts legislature is a bill proposing a second $200-million veterans' housing program. Other developments in state capitals affecting housing will include continued modernization of building codes.

• **Industrial development**—Legislation authorizing municipalities to issue revenue bonds to finance construction of industrial buildings for lease to private industry may increase in spite of opposition from organized investment bankers. Such laws were enacted last year by Alabama and Tennessee. Mississippi and Louisiana have similar laws.

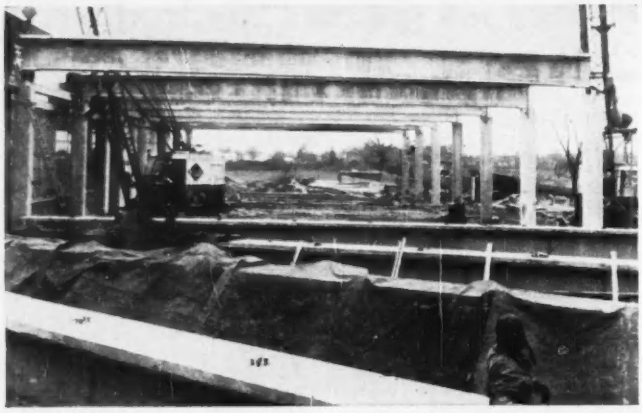
Creation of privately financed and operated state credit corporations to provide credit for business—such as are already functioning in Maine, New Hampshire, and Vermont—are likely to spread more widely. Legislative action on a similar plan is awaited in Massachusetts.

• **Water supply**—Whether the nation's growing water problems will be handled by the federal government or by state and interstate agencies, will be an issue that is to be decided in some states.

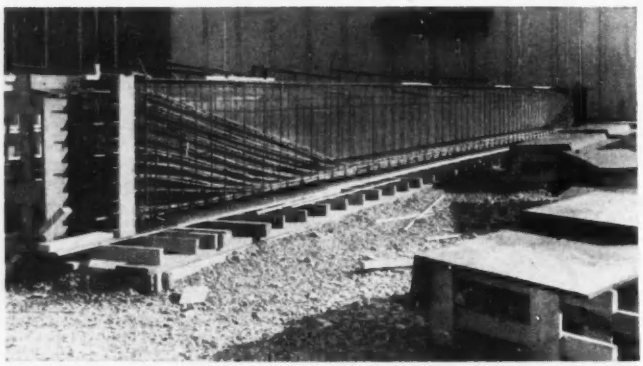
In California, the legislature will be asked to appropriate funds for engineering studies for the $1-billion Feather River project. Involving the largest system of water, flood control and hydroelectric works ever conceived for California, the project would be financed by means of revenue bonds.

In the East, the Interstate Commission on the Delaware River (Incodel) is continuing the hassle over its plan for Delaware, New Jersey, New York and Pennsylvania to join in a $500-million program for development of the upper Delaware River as a major source of potable water.

Prestressed building girders save steel



ROOF GIRDERS spanning 60 ft in a factory at Vermilion, Ohio, were prestressed.



CABLES for applying the prestress were placed in the forms before concreting.

JACK stretched the 3-wire cables. Wires have button heads at ends.

BARS atop precast columns were welded to girder bars and encased in concrete.

CLEVELAND—To beat the steel shortage, The Austin Co., engineers and builders here have turned to prestressed concrete. Indicative of the savings possible, the company says it needs less than one-third the steel required for ordinary steel framing for the 60-ft prestressed girders in a building they are now erecting.

The design is based on experience gained last summer, when Austin tested to destruction several full-size prestressed girders heavily plastered with strain gages.

First industrial application is to roof girders in a one-story, 60 x 240-ft addition to the F. W. Wakefield Brass Co. plant at Vermilion, Ohio. Supported on precast reinforced concrete columns at 20-ft intervals, the girders carry steel purlins and a wood roof.

The 60-ft members were precast and prestressed on the site. Made of 5,000-psi concrete, they are I-shape in section, 40 in. deep. The top flange is 30 in. wide and about 6 in. thick; the web is 6 in. thick; and the bottom flange 12 in. wide and 8 in. thick. Each girder weighs about 12½ tons.

Cast in plywood forms, the girders were prestressed a week later, after the concrete had attained sufficient strength. A 60-ton center-hole hydraulic jack acting against the end of a member applied a stress of 145,000 psi to each of 60 strands of ¼-in. dia wire encased in it. (The wire has an ultimate strength of 220,000 psi.) With allowance for shrinkage and plastic flow, working stress was assumed at 123,000 psi.

Wires were grouped in ten double cables of three wires each. They were coated with an asphaltic material and waterproof paper to prevent bond with the concrete. A button head was pressed on each wire end for anchorage purposes.

Stirrups, ⅜ in. in diameter, were spaced 12 in. apart in the center part of the girders and at closer intervals near the ends, to align the cables and supplementary reinforcing bars. Some of the reinforcing bars protrude beyond the ends of the girders. These were welded to column dowels and to bars from longitudinal reinforced concrete struts that brace the columns. Forms then were placed around these end connections and concrete cast in them, encasing the anchorages and bars and producing a smooth exterior.

Experience and cost data gained on this job will be the basis of further investigations, says J. K. Gannett, vice president and director of engineering and research, of The Austin Co.

480-ft span for Chesapeake Bay Bridge breaks loose and goes on rampage

BALTIMORE—A 480-ft span for the new Chesapeake Bay Bridge broke loose from towing tugs last week, struck the supporting trusses of the bridge, and eventually went aground on the Eastern Shore of Maryland near the Matapeake ferry slip. No one was injured.

There was no official estimate of damage to the bridge structure, but one engineer said the damage might run to more than $100,000.

The accident occurred about noon in a high wind when a towing line, attached to one of the tugs, snapped. This made it impossible to maneuver the 1,500-ton structure which rose about 130 ft above the water level, and the span gradually drifted eastward.

The span was being floated on four barges. It struck the bridge near piers No. 36 and 37. When this happened several of the workmen jumped over the sides of the barges.

Other workmen were taken off the barges as the huge steel assembly drifted toward the Matapeake, and the rest were taken off after the barges went aground.

• **Explanation**—A spokesman for the J. E. Griener Co., consulting engineers for the bridge project, said one of the two lines attached to the tugs snapped in a sudden squall.

When the barge reached the eastern shore their compartments were flooded in order to ground them securely.

The span was being towed out to piers No. 28 and 29 when the accident occurred. It was made up of two trusses attached to each other, and was the full width of the roadway over the bridge. Piers No. 28 and 29 are east of the main ship channel.

In November, 1950, during a sudden storm a barge of fabricated steel pilings, valued at $70,000 was cast adrift and lost for several weeks. This barge was recovered after an extensive air—sea search. Damage in that storm, which included damage to the bridge proper, totalled $243,000, the Griener Co. announced here.

Six-mile bore completed under Utah mountain

SALT LAKE CITY—The $6.5 million Duchesne Tunnel, a 6-mi bore under 10,500 ft high Broadhead Mountain in Utah's Uintah Range, was holed through last month, marking near-completion of an 11-year effort to link the Colorado River Basin with the Salt Lake Valley for water diversion purposes.

A temperature of −210 f on the mountain slopes outside the big bore indicates conditions faced by Grafe-Callahan Construction Co. workmen driving the tunnel. B. A. Peters, project manager for the contractors, and general superintendent Ray C. Blasongame noted that work crews have had to negotiate 18-mi of deep snow between Kamas and the tunnel entry to reach their jobs.

• **First start**—The bore was actually begun in 1940, but work was stopped in 1942 because of World War II after 2.3 mi were driven. Grafe-Callahan took over in October, 1949, driving 3.7 mi of the 11 x 11 ft bore since that date. The finished bore, horseshoe shaped, will be 9½ ft from floor to ceiling, and is to be capable of handling a flow of 600 cfs. The drop from the east portal to the west in the 6-mi tunnel will be 63.33 ft.

• **Water flow**—A Bureau of Reclamation project, the Duchesne Tunnel will, for the first time on a large scale, bring Colorado River drainage basin water into the Salt Lake Valley. The bore itself pierces a portion of the Unitah Range, tapping water in the North Fork of the Duchesne River and carrying it through to the Provo River. The Provo in turn flows into Deer Creek Reservoir, a storage basin already in use.

Deer Creek Reservoir water, in turn, flows to the newly-finished Salt Lake Aqueduct through Provo Canyon, thus passing through a natural notch in the 12,000 ft high Wasatch Range. The aqueduct, swinging north through Utah Valley, connects with new and existing lines serving such communities as Provo, and ends at the twin Terminal Reservoirs just completed in Salt Lake City.

The Duchesne Tunnel flow from the Duchesne River is expected to add 30,000 acre-ft annually to the supplies previously available in the Deer Creek Reservoir.

During November, Grafe-Callahan crews drove and supported 1434 ft of tunnel as the bore neared the holing through point. The holing through occurred 200 ft from the east portal of the tunnel, the short sector of the bore having been driven a year ago so the final blast would not break through into avalanche territory. Work by Grafe-Callahan has consisted of cleaning up and relining the major part of the original pre-war bore.

NEWS BRIEFS

• **Clark Hill starts filling**—Gates of the Clark Hill reservoir near Augusta, Ga., were closed late last month and the 40-mile-long reservoir started filling. It is expected that water will reach the 300-ft level by next April. The huge government power project will cost more than $80 million and provide 280,000 kw of power capacity. The first generator will go into operation next October.

• **To study atomic effects**—An advance study of Savannah River pollution and biological conditions is being made by the U. S. Public Health Service in order to be able later on to learn the effects of Atomic Energy Commission operations upon those conditions.

• **Second barrel of aqueduct**—A special election is to be held soon to approve a Navy contract for the construction of a second barrel of the San Diego, Calif., aqueduct. The contract would be between the Navy and the San Diego County Water Authority, contracting agency for delivery of Colorado River water to county distributing agencies.

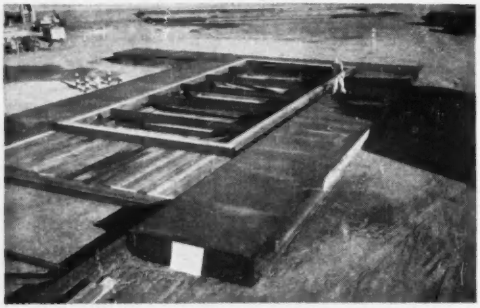
• **Utility boom**—Expenditure of $2,750 million for construction next year—$500 million more than in 1951—is planned by the electric utilities. In a year-end statement, George M. Badsby, president of the Edison Electric Institute, warned however that "the industry is straining against a bottleneck in the flow of steel, copper, aluminum, nickel and other alloy metals to manufacturers of heavy equipment for power stations".

• **Gets more funds**—Pennsylvania's legislature has voted its General State Authority an increase of $60 million in borrowing capacity to undertake institutional construction and flood control projects.

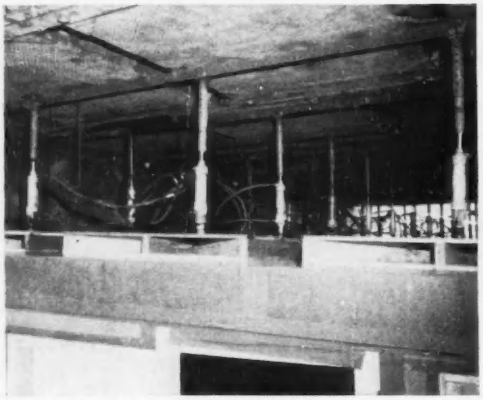
• **Fort Lauderdale tunnels**—The Florida Road Department has approved plans for a $17 million system of tunnels and bridges at Fort Lauderdale and nearby places in Broward County. The state will pay $2 million and $15 million is to be raised by self-liquidating bonds to be paid off by tolls and by the county's share of the state's 7-cent gasoline tax.

• **Big budget requests in N. Y.**—State departments in N. Y. state have asked $400 million for capital construction in 1952-53. This is an increase of $278 million over this year's appropriations.

1 TRACK 330 ft long made of I-beams marks the production line for testing prefabricated buildings. On it . . .



2 MOVABLE PLATFORMS built of channels and fitted with flanged wheels roll, pulled by a winch. Each carries . . .



5 LOAD TESTS are made in a bent made of pontoon strings, which takes reaction from hydraulic jacks. Simultaneously . . .

6 SIDE WALL (left above) and roof (Fig. 5) are uniformly loaded. Meanwhile, inside the structure . . .

Production-line tests maul prefabs

K. R. Steele

Director
Framed Structures Division
U. S. Naval C. E. Laboratory
Port Hueneme, Calif.

To GUIDE the Navy in purchasing newly designed prefabricated buildings, the U. S. Naval Civil Engineering Research and Evaluation Laboratory is putting structures submitted for consideration by manufacturers through a series of critical tests. These are made virtually on a mass-production basis, because of the large number of buildings to be evaluated.

Structural engineers generally find it difficult or impossible to predict the behavior of prefabs under load by computing stresses, because of the complexity of the structures. What calculations can be made have to be based on simplifying assumptions.

Whether or not these assumptions are accurate depends on the experience and resourcefulness of the engineers. In many cases, design assumptions represent nothing more than an educated guess.

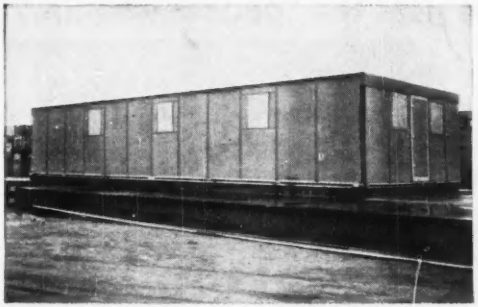
Navy engineers wanted to be certain. They decided to eliminate the guesswork by testing full-size structures. So they turned the problem over to the C. E. laboratory.

• **Novel test facilities**—The Framed Structures Division of the laboratory found the answer. It developed a unique test facility to obtain data for comparing certain features of the newly designed prefabricated barracks, even though the only similarity between the buildings is a 20x48-ft plan. Reports are made on (1) erection and packaging; (2) strength; and (3) tightness of the structures.

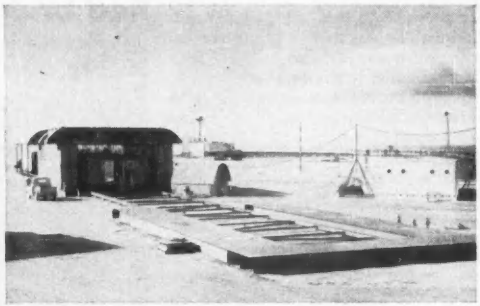
The facility is designed for carrying out tests efficiently on the large number of buildings to be evaluated. Erection studies are made at one end, after which the buildings are rolled on a track to a strength-testing area and finally to a tightness-evaluation area at the other end.

A 330-ft track of 10-in. 25-lb I-beams, braced with 4-in. 7.7-lb I-beams, was provided for the production testing. Two all-welded steel platforms, 20x47 ft in plan, were constructed to serve as movable bases for the buildings as they progress along the track to various test stations. Fabricated of 12-in. 20.7-lb channels, braced laterally at 8-ft intervals and diagonally across the corners, these platforms each have 12 flanged 8-in. wheels and are moved along the track with a winch. To allow for variation in track width, the wheels are permitted to float horizontally on the axles, with a displacement of 1½ in.

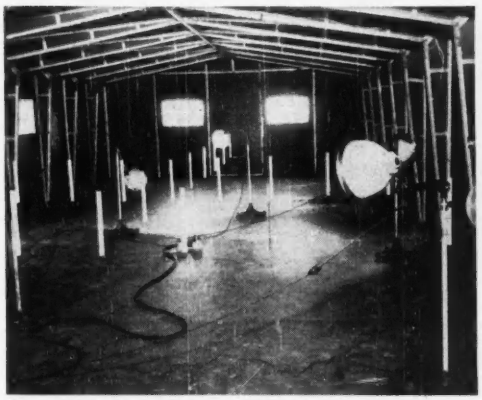
• **Erection studies**—The initial 100



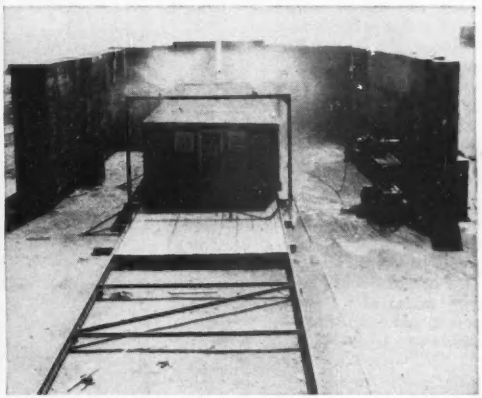
3 TEST BUILDING, 20x48 ft in plan, which the Navy is considering buying. There are three test stations on . . .



4 TEST FACILITY for making erection, strength and tightness studies. First 100 ft is for erection. In center . . .



7 GRAPH PAPER glued on metal plates and hung from the roof are observed with a level to measure deflections. Next . . .



8 WATER SPRAYS test the tightness of the building in an area at the far end of the track surrounded by a windbreak.

ft of track is used for erection studies. The two platforms permit simultaneous erection or disassembly of two buildings.

Time required for erection is considered to be important in evaluation of these buildings. Experience indicates that if a structure is erected twice, the workmen will be sufficiently acquainted with the procedure; hence, erection time is not recorded until after two preliminary erections.

The test facility also serves the important function of uncovering field-erection difficulties.

Complete movie coverage and stills are taken of each building, and a detailed log of time and difficulties met in erection is recorded. If a building proves satisfactory over the remainder of the test program and is accepted, an erection manual may be prepared from these data.

• **Strength studies**—Test buildings are subjected to two loading conditions: (1) dead load plus 200% of the wind load (70 mph), and (2) dead load plus 200% of the snow load (20 psf).

A bent formed of pontoon strings was framed to envelop an entire test building, to provide a reaction for the test loads. For attaching hydraulic loading cylinders to the interior of the bent for roof tests, 3x3x¼-in. angles, spaced 4 ft apart, were welded to the pontoons. Vertical legs of the angles have ⅜-in. holes at 1-in. intervals, so that load points can be varied. The loading struts are attached to the angles through telescoping tubular jigs, which have a series of holes to permit adjustment in height.

Each cylinder applies load through a ball and socket joint to a 44x48-in. loading pad, which in turn transfers the load to the building. Loading pads consist of standard wood storage pallets reinforced with 2x4-in. diagonals and covered with ¾-in. thick cane-fiber boards, for better load distribution.

The roof loading system employs one strut per pad. On the sides, however, four pads are connected to one loading strut through an H-shape steel frame, to assure that each pad receives an equal load.

Accurate pressure control for the hydraulic system serving this complicated arrangement of loading struts required special consideration. Hydraulic pressure is provided with a piston-type pump, with a capacity of 5 gpm and a maximum pressure of 3,000 psi. The pump was so designed that pressure control may be maintained accurately throughout the entire working range by means of a high-pressure relief valve. This valve is also coupled hydraulically with another external relief valve at the main control panel. Input pressure to the panel can be regulated from the pump.

The hydraulic control panel was designed as a five-channel unit. Hence, it is possible to provide five different pressure levels from a constant source to the test buildings.

• **Uniform loading**—The main difference between this system and conventional system is in the use of solenoid valves to control eccentric loading of the building. In this facility, where such large distances are traversed by the pressure impulse from the

pump, it is essential that some means be provided to load the building uniformly. To accomplish this, one solenoid valve was installed in series with the hydraulic feeder line for every six struts on the roof system and every two struts on the side system. These valves are located as closely as possible to the inlet ports of the strut groups and are wired so that they are simultaneously energized by a master control switch at the control panel.

The procedure for reducing eccentricities of loading is to provide the proper load increment against closed valves. When the master control switch is thrown, the pressure impulse then has only to traverse the short distance from valve to struts. Thus, the required loading is applied at all points simultaneously.

Strain measurements are made on one interior building bent with electric strain gages. The gages are attached to the bents with a household cement and waterproofed with petrosen wax. An automatic scanning recorder unit is used to record strains.

Deflections are measured at various points along the building bents and ridge line with the aid of deflection tabs. These tabs are made by gluing graph paper on metal tabs cut from 1¼x¼-in. flat stock. They are suspended with music wire from the deflection points and read through a doorway with a wye level.

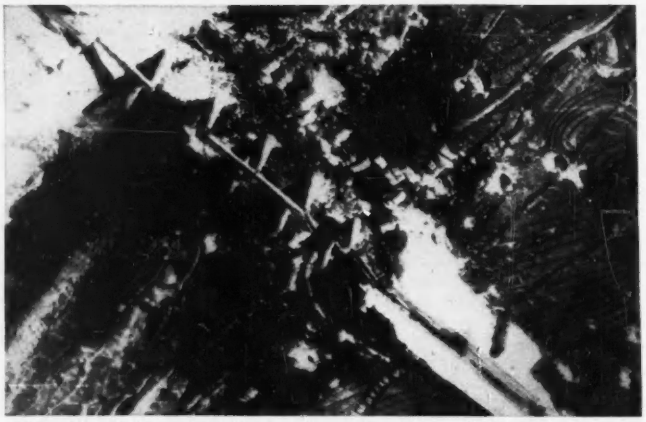
• **Tightness studies**—As a qualitative means of measuring the resistance of various buildings to rain penetration, a jig was designed for simulating a combination of vertical and wind-driven rain. Requiring a windbreak for proper operation, the jig was placed at the extreme end of the 330-ft track. Six sprinklers produce a simulated 2-in. per hour rainfall, and a turbine sprayer duster rig creates a 20-mph wind-driven rain. The two units consume about 40,000 gph.

Water penetration is demonstrated with photographs. Several engineers stationed within the building also make a physical inspection of the trouble points as they develop and attempt to isolate the probable cause.

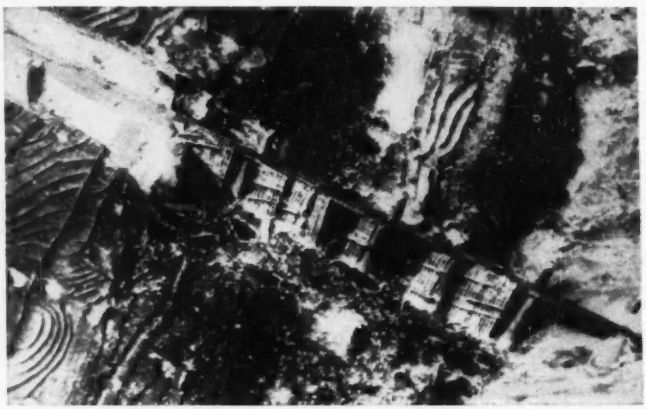
• **Good results obtained**—It can be said that the production-line techniques utilized in the design of the prefabricated-building test facility have proved very satisfactory from the standpoint of time, economy of operation and quality of results.

The Naval Civil Engineering Research and Evaluation Laboratory, at Port Hueneme, Calif., is a facility of the Bureau of Yards and Docks under the technical direction of F. E. Lowance and military command of Cdr. F. C. Tyrrell.

Red bridge gets the "double whammy"

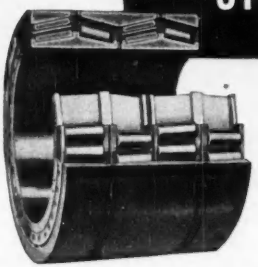


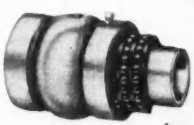
THIS COMMUNIST BRIDGE in northeast Korea between Kilchu and Songjin was a vital link in the Red supply system until it was put out of action by repeated air strikes by the U. S. Navy.



BUT IN 13 DAYS Communist engineers almost had their bridge ready for use again. Cribbing was used between the undamaged spans to complete the bridge across a ravine 600 ft wide.

BEFORE TRAFFIC COULD ROLL, however, carrier based planes of the Navy struck again with 2,000 pound bombs and ruined the structure completely. Only the concrete piers remain standing. (U. S. Navy photos from Wide World)





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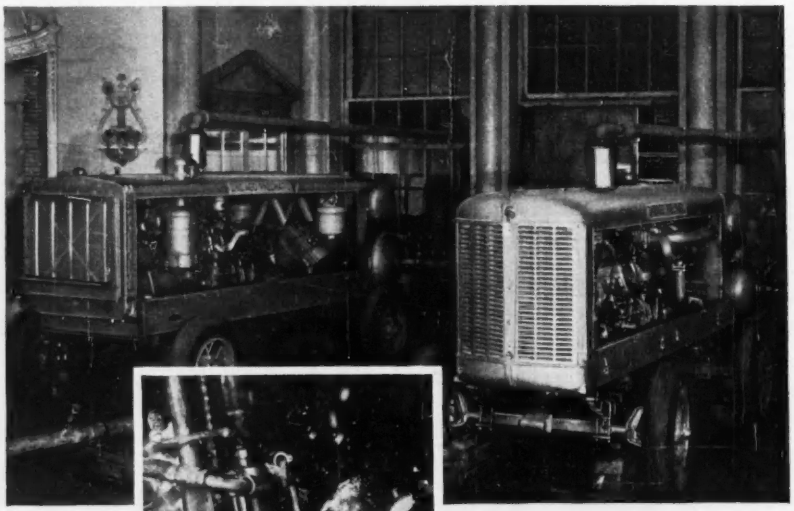

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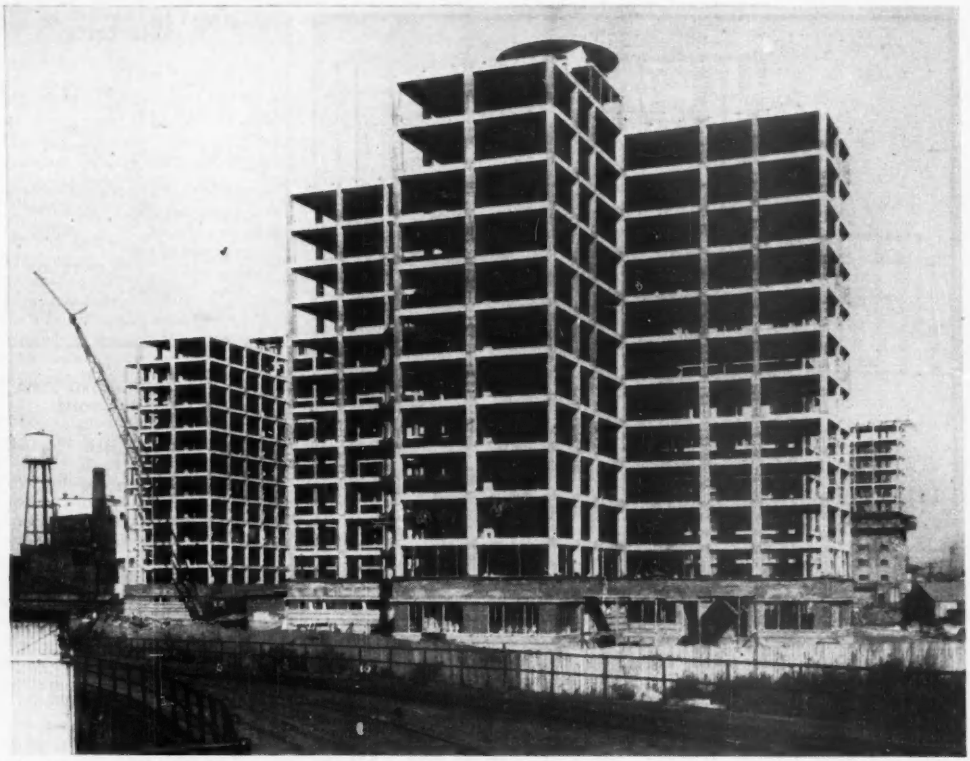


Twelve-story buildings of a Buffalo, N. Y., housing project get concrete frames when . . .

Housing authority finds concrete cheaper

James N. De Serio
Consulting Engineer
Buffalo, N. Y.

QUITE A FURORE was created in Buffalo, N. Y., when concrete framing was proposed for the Dante Place public-housing project. The local fabricating industry and the American Institute of Steel Construction battled the decision. They contended that structural steel would be less expensive. However, cost studies finally convinced the Buffalo Municipal Housing Authority that reinforced concrete would be more economical.

The project consists of seven 12-story buildings for housing 616 families. Part of a redevelopment of a rundown waterfront neighborhood, it is situated on a 6½-acre site along a ship canal near the mouth of the Niagara River. Buildings occupy less than 20% of this area.

Cross-shape in plan, these structures are made up of four wings, each 32 ft wide and about 55 ft long. Stairs and elevators are in the central core. Exterior walls are brick, with tile or concrete block backup.

• **Framing costs compared**—Extensive preliminary studies were made by the architect and the engineer. Included were investigations of the effect on costs of the number and type of buildings and type of framing.

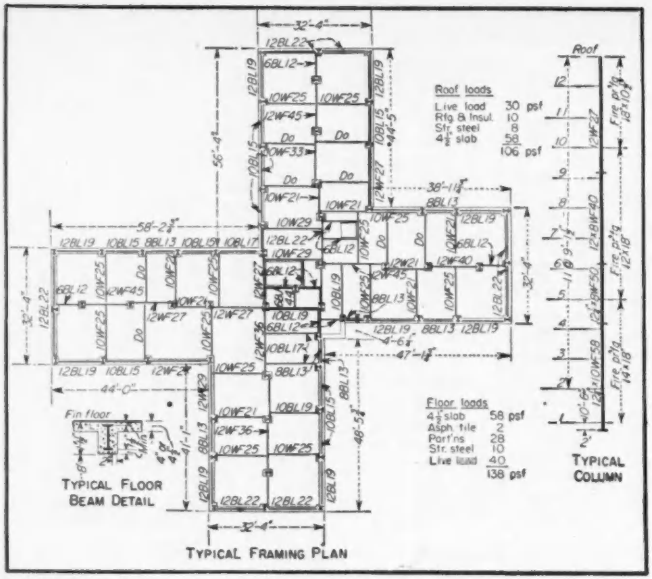
These studies showed that six 14-story structures would cost about 8% less than seven 12-story buildings and 20% less than nine ten-story buildings. Because of land limitations anyway, it was not practical to use 10-story apartment houses, and zoning restrictions eliminated the 14-story group. Hence, the decision was made to build 12-story structures.

Before the type of framing was selected, records of public-housing projects in New York City were studied. There, 40 of the 42 multistory developments built by the city housing authority have reinforced concrete frames, some of which are as much as 18 stories high. Also, records were examined of several privately financed projects in New York City that have reinforced concrete frames up to 18 stories high.

Then, preliminary designs were made with concrete or structural steel frames for the Dante Place project. When calculations conclusively showed an advantage for concrete framing, this was recommended.

Local fabricators and the AISC protested. The Buffalo Municipal Housing Authority listened to arguments from both sides, then ordered its engineers to prepare complete floor and column designs for both steel and concrete frames. These plans were to be submitted to contractors for preliminary pricing. The AISC hired another engineer to make a competitive design, which also was submitted to the contractors.

Results of this study are given in



STEEL FRAMING was considered for the housing project but appeared more expensive than reinforced concrete, as indicated in Table III.

Table I. All contractors but one priced concrete lower than steel.

• **Height studies**—There were other important factors to consider. The New York State Multiple Dwelling Law requires that a clear height of 8 ft be provided under ceilings or ceiling beams in a room. Here again concrete showed to advantage, as indicated in Table II, since beams occurred only at partitions or over closets.

Height comparisons led to the conclusion that a steel frame would require the equivalent of almost one additional story in height. There would also have been accompanying increases in cost of masonry, partitions, piping, conduits and stairs. Design heights adopted were 8 ft 6 in. floor to floor and total height of 104 ft to the roof, elevator penthouses and water towers extending 35 ft higher.

With the figures in Table I and II, it is possible to determine the saving in frame costs with concrete (Table III). Total indicated saving amounts to 6.76% of the general contract cost, proving original studies were correct.

TABLE I—COSTS PER SQUARE FOOT OF PRELIMINARY DESIGNS

	Concrete Frame	Engineer's Steel Frame	AISC Steel Frame
Engineer's Estimate	$1.825	$2.335	$2.302
Contractor A, N. Y. C.	1.68	.....	.....
Contractor B, N. Y. C.	1.81	.....	.....
Contractor C, Buffalo	1.945	2.499	2.41
Contractor D, Buffalo	2.178	.....	2.053
Contractor E, Buffalo	No estimate, but stated concrete was cheaper		

TABLE II—HEIGHT COMPARISON

	Concrete Frame	Structural Steel Frame
Clear height under ceiling beams	8 ft	8 ft
Minimum height to ceiling	8 ft	8 ft 8 in.
Total minimum floor-to-floor height	8 ft 5 in.	9 ft 1½ in.
Minimum height for 12 stories	103 ft 1 in.	110 ft 1½ in.

Note—First-story height was set at 10 ft 6 in. floor to floor.

TABLE III—SAVING IN FRAMING COSTS

Low structural steel estimate	$2.053 per sq ft
Low concrete estimate	1.680
Saving	0.373
For 616,644 sq ft of supported floor area:	
Saving in framing costs	$230,008
Saving in brickwork	28,030
Saving in plaster, partitions, etc.	12,000
Total indicated saving	270,038

TABLE IV—ESTIMATED STEEL QUANTITIES—TONS

	Steel Frame	Concrete Frame
Structural steel	3,400	0
Shelf angles for lintels	200	100
Reinforcing steel	800	2,100
Total	4,400	2,200

Estimated savings in steel are given in Table IV. Actual design requirements for the concrete frame were 2,050 tons—less than indicated in the table. Thus, there was a net saving of 2,350 tons of steel for the project.

• **Fire resistance considered**—In addition to challenging the economy of concrete construction, the AISC also submitted to the Buffalo director of buildings fire-test results showing that concrete slabs made with gravel aggregates did not have good fire-resistance qualities. For a 4-hour rating, it was contended, such a slab without a plaster ceiling should be at least 8 in. thick. (Underside of slabs in the Dante Place project were to be painted, but not plastered).

In turn, the consulting engineer for the project submitted data showing that a 3-hour rating could be applied to an unplastered 5-in. slab if the concrete is made with slag or crushed limestone aggregates. These data were accepted, and specifications limited aggregates to the two approved.

• **No beams in rooms**—Final design of the structural frames called for 3,000-psi concrete in beams, slabs, pile caps and most columns at 28 days. Lower portions of columns around elevator shafts were designed for 3,500-psi concrete.

In general, construction consists of a 5-in. slab spanning over a central longitudinal beam and supported by

a spandrel at each end. The spandrel, 10 x 15½ in., is carried completely around the building. The longitudinal beam in the center is generally 22 in. wide by 14 in. deep and is so located that it generally is hidden in closets.

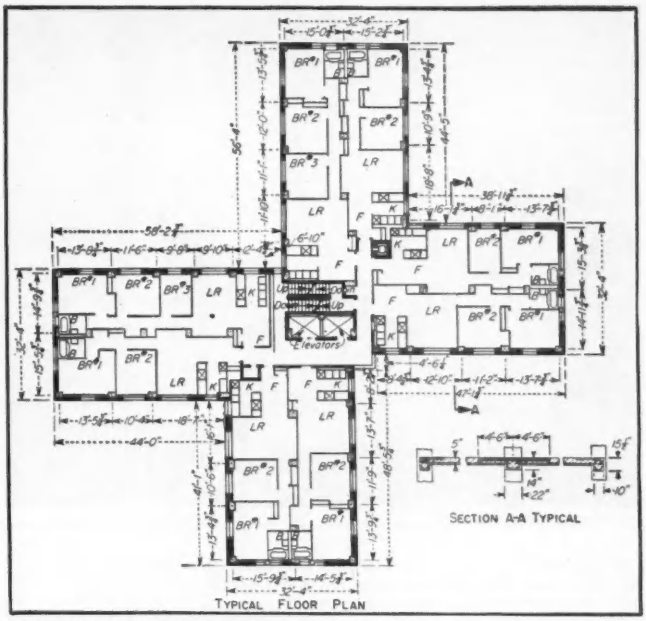
Interior columns also are hidden in closets. Exterior columns are placed in the corners of the rooms. Symmetry was not possible in location of columns, or in lengths of beams.

It took considerable study with the architect to arrange rooms and column locations so that spans for both slabs and beams would not be uneconomical. The architects were extremely cooperative in re-arranging room layouts to fit both minimum and maximum requirements for structural framing.

• **Mix ingredients**—Various design mixes were made and tested by Pittsburgh Testing Laboratory. Mixes with crushed limestone tended to be harsh, hard to finish and more subject to segregation. Mixes with slag were quite plastic and had good workability.

The final design mix contained 5.5 bags of high early strength cement, 1,580 lb of sand, 1,470 lb (65% of No. 2 & 35% of No. 1) slag per cubic yard and 37 gal of water (total including surface moisture). Slump varied from 4 to 6 in.

• **Rigid-frame design**—A wind-stress analysis was made for a complete building by the cantilever method. Wind pressure was taken at 30 psf. It was found that the worst condition occurred when the wind was broadside, since the wings acted as horizontal cantilevers, and all the load was taken through the three middle frames. However, since the height-to-width ratio was only 0.81, wind stresses were not high and were relatively easy to handle.



APPROVED LAYOUT with reinforced concrete framing has interior beams hidden in closets minimizing story heights, and columns in room corners.

Beams and spandrels were designed as rigid frames with the columns. This entailed considerable work, but a more economical structure resulted.

• **Forms re-used several times**—All floors above the second are identical in framing. Roof framing is the same as that in the floors, except that less reinforcing steel is used. Where penthouse walls are carried on the roof, an upturned beam is provided so that there are no changes in floor or beam forms.

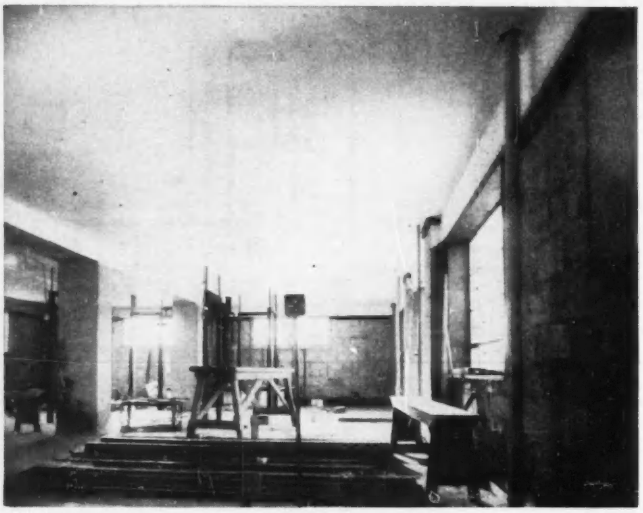
Columns have only one size change in the full height, and this occurs at the seventh floor. The needed variation in load-carrying capacity is made in the reinforcing steel. Corner columns and elevator-shaft columns are one size for the full 12 stories.

All wall columns are 14 in. deep and vary in width from 10 in. for the top six stories to a maximum of 22 in. in the lower six stories. Interior columns are 22 in. deep and range in width from 10 in. for the top six stories, to a maximum of 20 in. in the lower six stories.

This design permitted maximum re-

TABLE V—ESTIMATED COSTS AND LOW BIDS FOR DANTE PL. PROJECT

Contract	Est. Cost Dec. 1, 1949	Additional Allowance for wage increase	Total Estimated cost	Low Bids (Contracts Awarded) Sept., 1950	Cost per Dwelling unit	Cost per cubic ft (5,556,000 cf)
General Const. Incl. Foundation	$3,998,555	$84,056	$4,082,611	$4,113,400	$6,677.60	$0.7403
Plumbing	529,458	4,000	533,458	675,000	1,095.80	0.1215
Heating & Vent.	454,292	.....	454,292	561,877	912.13	0.1011
Electric	261,800	9,856	271,656	249,288	404.68	0.0449
Elevators	184,800	.....	184,800	143,555	233.04	0.0259
TOTALS	5,428,905	97,912	5,526,817	5,743,120	9,323.25	1.0337
Ranges & Refrigs.	117,040	.....	117,040	.....	190.00	.....
Serv. & Maint. Equip't	18,480	.....	18,480	.....	30.00	.....
Playground & Comm. equipment Landscaping	105,214	.....	105,214	.....	170.80	.....
TOTAL COST	$5,669,639	$97,912	$5,767,551	.....	$9,714.05	.....



CEILINGS in the apartments in the Dante Pl. project are painted but not plastered.

use of forms. It is possible to re-use all slab, beam and column forms at least six times without changing them.

• **Substructure design**—Foundations for these buildings were a relatively simple problem. Driving logs of test borings showed that penetration to rock would be almost impossible for any type of pile except steel H-piles, unless jetting was allowed. Steel H-piles could be obtained readily and could be driven to bearing on rock. Ease of handling was also in their favor. Cost estimates favored them, and given a choice of H-piles or cast-in-place steel-encased concrete piles, the contractor chose the H-piles.

Foundations are designed for 40 tons per pile. There are 1,971 piles (8BP36 sections) with a total length of about 44,800 ft. A 12 x $\frac{7}{8}$ x 12-in. cap plate is welded to the top of each pile.

• **Bids close to estimates**—Costs for the complete structure had to be estimated closely so that an appropriation could be made for construction. A detailed estimate of all quantities was made, as for a contractor's estimate, labor and material prices being checked with local contractors. Since the estimate was made in Dec., 1949, a rise in labor rates, which was then being discussed by the unions, had to be anticipated.

The bid tabulation (Table V) shows how close estimates came to actual bids received. These prices are for construction only and do not include condemnation and demolition costs. There were many substandard two-story row dwellings to be demolished, a large abandoned church and several factories.

• **Design highlights**—In this project, all dwelling units are above the ground floor. In the first story are offices, social and meeting rooms, space for maintenance equipment and shops.

Dwelling units have plastered walls, asphalt-tile floors and exposed concrete ceilings, which are painted. Bathrooms have ceramic tile floors.

Corridors and stairs have glazed tile walls and tile floors. Stairs are scissor-type, which has been widely used in New York City (ENR April 17, 1947, p94). This makes possible two completely enclosed stairways in one shaft, at a tremendous saving in cost and floor area.

Two passenger-operated elevators are provided in each building. These have a speed of 100 fpm and are the skip-floor type. Each elevator stops only at alternate floors—a maximum of six stops per elevator.

A central heating plant in one building supplies steam heat and hot water to all units. Distribution lines are carried between buildings in underground tunnels. Removable top slabs at various points simplify repair work. Roofs of tunnels also serve as walks.

• **Close construction schedule**—Pile driving started in Jan., 1951, and was completed by April 1. Concrete foundations were started Feb. 15 and finished April 15.

Superstructure concrete was begun late in April. Since that time, the contractor has averaged one floor per day. (Average floor area is 7,260 sq ft, and there are approximately 165 cu yd of concrete in each floor including beams, slabs and columns).

With high early strength cement, concrete reached sufficient strength to permit column forms to be stripped in 24 hours and beam and slab forms within 48 hours. This made it possible for the contractor to maintain a fast schedule, with completion of all concrete superstructure work by October 15. All concrete was placed with a crane and a 1¾-cu yd bottom-dump bucket.

At sixth-floor level, dead-man hooks were cast into floor slabs as anchors for outriggers, to pick up swinging scaffolds for brickwork. In this manner, the lower masonry work went up while the balance of the superstructure was poured.

Contract for the general construction is held as a joint venture by the John W. Cowper Co., of Buffalo, and Corbetta Construction Co., of New York City.

Backus, Crane & Love, of Buffalo, are the architects, Beman & Candee, consulting mechanical engineers, and James N. De Serio, consulting structural engineer.

Providence "burns smoke" in war on air pollution

Now they are "burning smoke" in Providence, R. I.'s, war against air pollution.

Two firms in the city have adopted a system proposed by Austin C. Daley, city air pollution engineer, after engineers from New York, Boston and M.I.T. studied the problem with little success. Daley's system introduces smoke into a 3,000-degree secondary heater for complete combustion.

One firm, the Union Smelting and Refining Works, recovers copper from insulated wire by burning off the casings. The other, the Acoon Cooperage Co., reconditions steel drums, first burning off the old paint and lining materials. Both considered their methods the most economical.

Union's problem was the greater. If the 1500 degree Farenheit temperature at which the castings were removed was exceeded greatly, the recovered copper would be oxidized.

Daley suggested the company build an auxiliary furnace. Vents draw the unburned debris from the smelting burners. The thick smoke is blown into a burner where oil flames at 3,000 degrees Farenheit "burn the smoke." Even when Union is working at full capacity the stack shows only a trace of smoke. At the cooperage plant the former smoke that blanketed the vicinity has vanished since a similar set-up has been installed.

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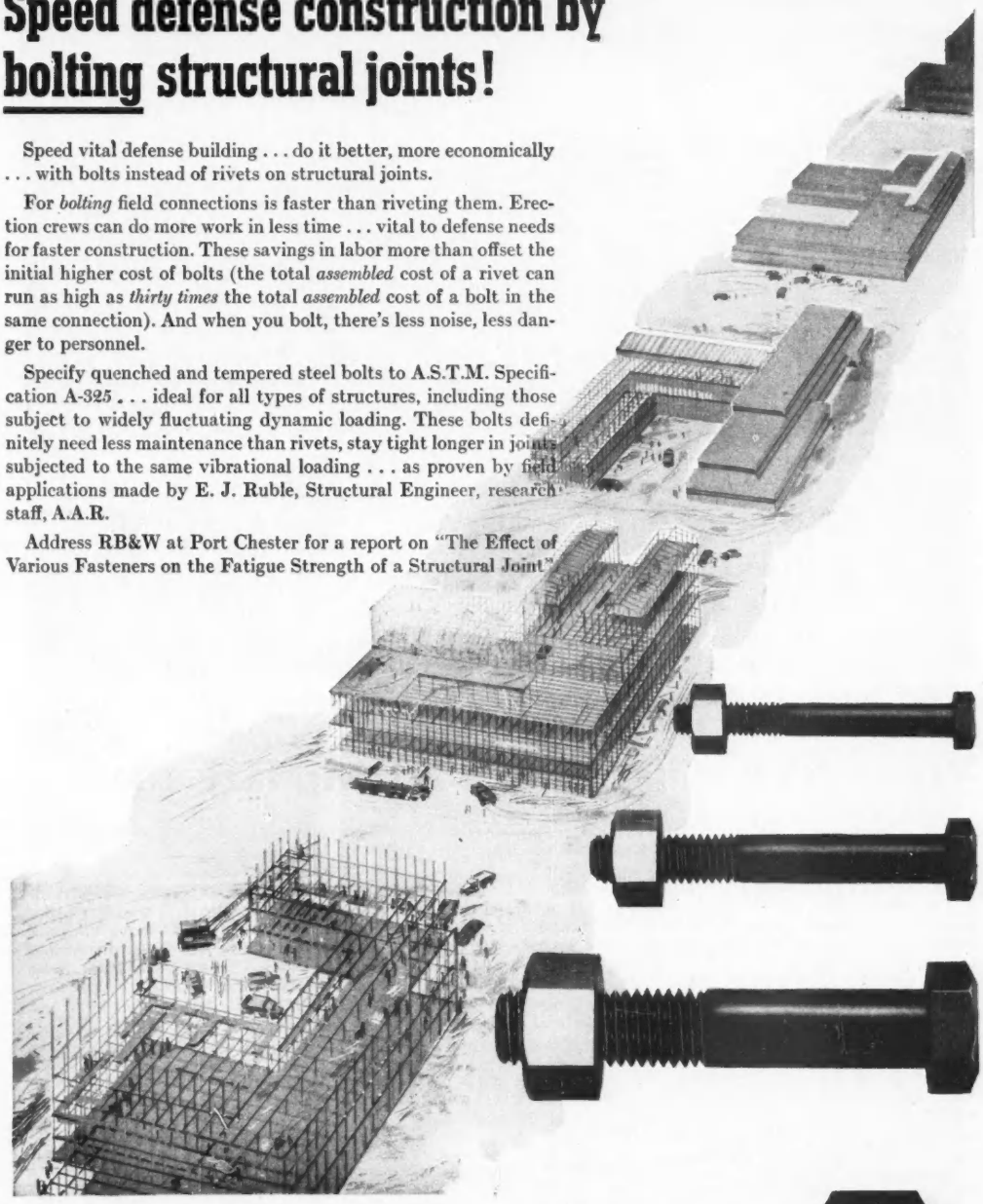

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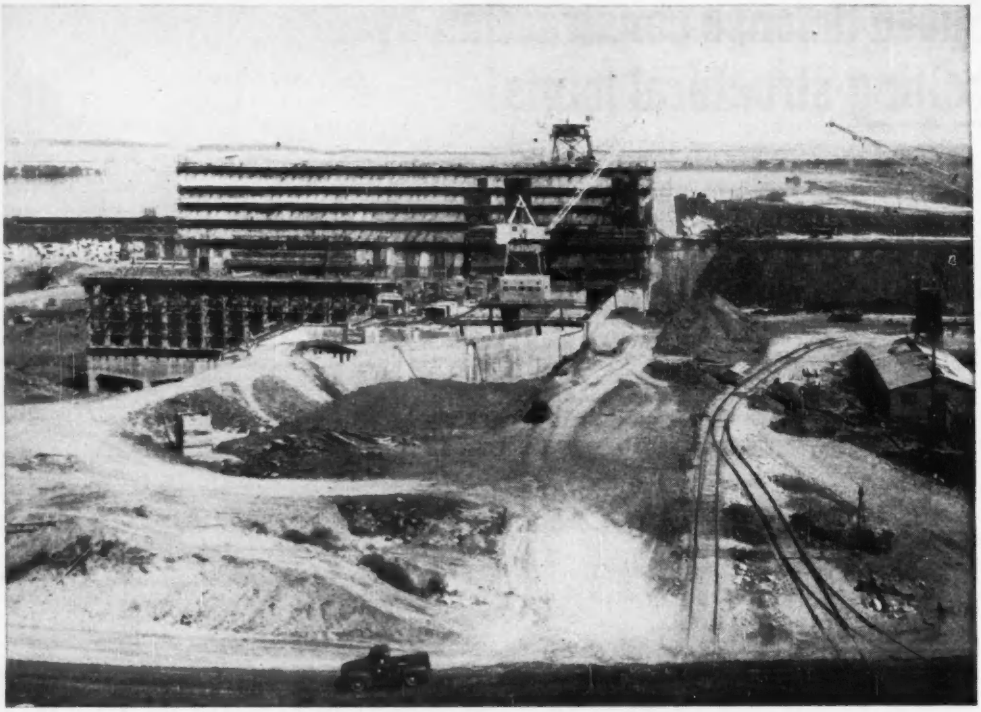


As first part of huge powerhouse takes shape it begins to be clear . . .

What $58 million buys at McNary Dam

IN THESE DAYS of multibillion dollar expenditures for defense purposes, $58,000,000 may seem like a small sum, comparatively speaking. Yet that is the value ($58,416,459.50 to be exact) of the largest contract in construction history to be awarded on a competitive bid basis.

The contract, known as the McNary Dam Completion Contract, is held by McNary Dam Contractors—a joint venture of Guy F. Atkinson Co., Ostrander Construction Co. and J. A. Jones Construction Co. Scheduled for completion Aug. 1, 1954, the work will substantially finish major construction on this $281,650,000 (latest estimate based on July 1, 1951 cost level) power and navigation project on the Columbia River.

The completion contract is the biggest and most complex of more than 16 major contracts that have been let for the job—the others range in dollar value from $700,000 to $21,000,000. Purpose of this article is to show what the Corps of Engineers is getting for the $58,000,000 and how the contractor is organized to make this tremendous expenditure in the short time available.

• **Job has many phases**—The completion contract is so complex that it's hard to put your finger on just what makes it big. There are, for example, 236 different bid items. These include 1,383,000 cu yd of excavation and 1,270,000 cu yd of fill. And they cover literally hundreds of items like safety treads, anchor bolts, piezometer piping, galvanized conduits and fittings, lighting fixtures, fish viewing windows, gate valves, steel grating and structural steel stoplog guides.

There are almost 100 lb of reinforcing steel for every cubic yard of concrete to be placed. This latter figure more than any other shows the complexity of the job. True, the volume of concrete is not great as measured by other recent jobs—it is less than 1,000,000 cu yd. But it is almost entirely structural concrete.

Many individual pours are necessary to total that much concrete. Largest single mass pour is about 1,500 cu yd. There are literally hundreds of small pours that must be scheduled, formed, batched, placed, stripped, and cured.

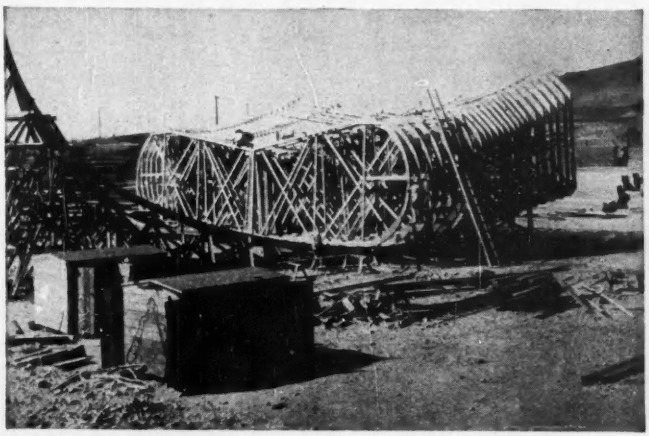
Much of the work is in the 1,422-ft-long powerhouse. Nearly 50 separate pours must be made in raising one section of the powerhouse from foundation to roof.

• **What has happened before**—Before going into details of how the contractor organizes this complex concrete work and what his personnel setup is,

Earlier ENR Articles on McNary Dam

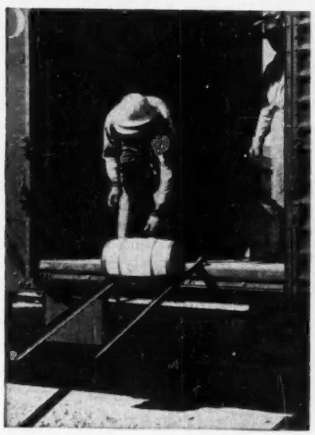
- Highest lift lock (Sept. 30, 1948, p 46)
- Step two starts (Aug. 11, 1949, p 26)
- River diversion plan (June 29, 1950, p 27)
- Moving roads and rails (Oct 26, 1950, p 39)
- Diversion's toughest part (Dec. 14, 1950, p 31)

Among other things it buys—

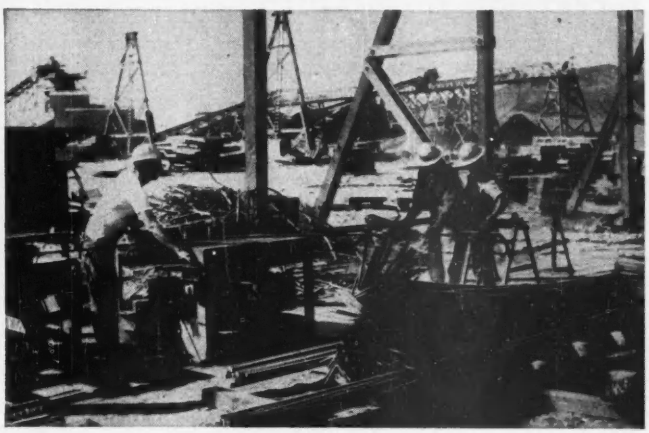


big forms . . .

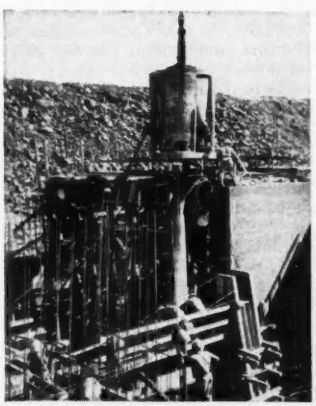
. . . and little forms,



nails by the carload,



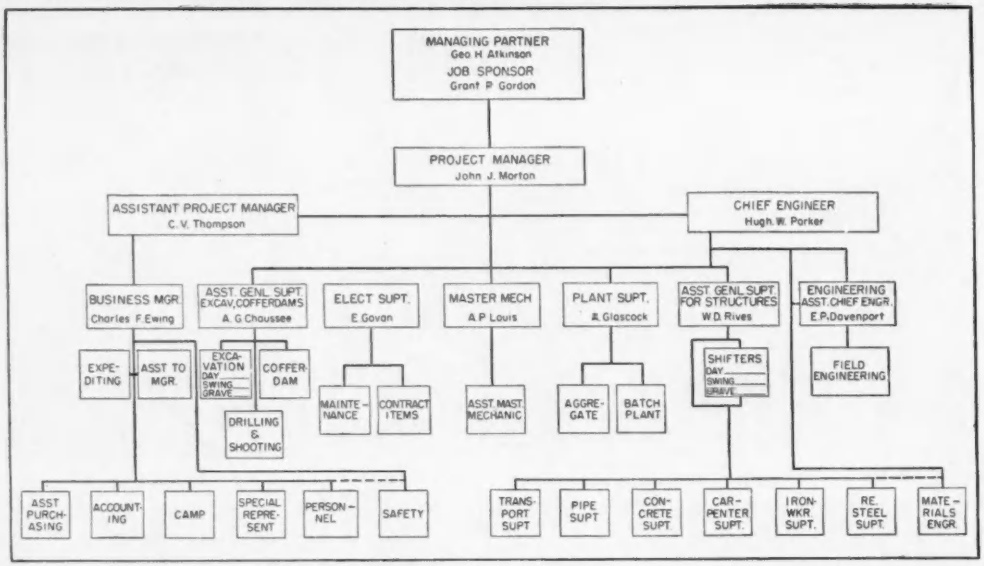
reinforcing by the thousands of tons,



a million cu yd of structural concrete and . . .

. . . trailers by the acre

Here's how the contractors forces are organized . . .



let's consider what has happened up to now at McNary. The completion contract is the third large construction contract. On all three, the same joint venture—McNary Dam Contractors—has been successful low bidder.

First-stage contract for $21,649,000 was for construction of the navigation lock and 13 spillway bays (lock excavation and building the Washington shore cofferdam were accomplished under earlier contracts).

Second-stage contract, worth $15,840,000, was for construction of the Oregon shore cofferdam, a junior cofferdam, and first step powerhouse concrete work. Most spectacular part of this second-stage work was diversion of the river—termed the toughest river diversion in construction history. The river was diverted through the previously constructed 12 spillway bays which had been left 40 ft low.

The completion contract is what its name infers, a contract for completing the structure. It will include completion of the powerhouse, completion of the other 8½ spillway bays, raising the first 13½ spillway bays up to final elevation, pouring a sill in the navigation lock, building the Oregon shore fish ladders and all the other things that are necessary to finish the structure proper. It does not, however, include installation of turbines and generating equipment. This work will continue after the structure is built.

• **Provides vital power**—Although underway since 1947—long before the present defense effort began—McNary is considered a contributory defense project since it will provide 980,000 kw of installed generating capacity for the power-short Pacific Northwest (ENR Oct. 18, p 128). First power is due on the line late in 1953 with additional 70,000-kw generators being installed at about 3-month intervals until all 14 units are available.

Because power is so vital to the Pacific Northwest at this time, the work is on as tight a time schedule as could possibly be set up. This makes the job even more complex.

There are five different completion dates to be met. Should the contractor fail to meet any one deadline, there is a daily penalty of $1,000. These completion dates are established to assure early delivery of power.

The first deadline is the construction of a railroad spur on the Oregon shore near the powerhouse. This must be done by Jan. 1, 1952. Purpose of this is to permit delivery of powerhouse equipment purchased under other contracts.

Second completion date is for installation of the powerhouse bridge cranes and this must be done by April 1, 1952. This will permit installation of equipment in the powerhouse.

Next completion date is for removal of the cofferdam and this must be done by March 1, 1953. This means that all the powerhouse and spillway work inside the cofferdam must be at such an elevation that the cofferdam can be removed during the winter low water period without threatening the job.

Fourth completion date is the raising of the upstream sill of the navigation lock and this must be done by March 15, 1953. The catch in this completion date is that navigation cannot be interrupted before Jan. 1, 1953. That gives the contractor only two and a half months to perform this work.

Final completion date for the entire contract is Aug. 1, 1954.

• **Hold up**—This contract got off to a late start because of flood conditions. The job was bid in April, 1951, and awarded in May. From May 14 to July 1 the cofferdam was flooded. That's because flows of greater than 400,000 cfs overtop the cofferdam. Further complication was the failure of a 66-ft dia sheetpile cell.

Delays such as those resulting from the cofferdam flooding are very difficult to make up. At McNary there's so much forming to be done, reinforcing steel to be placed and concrete to be poured that if the job gets a day behind schedule it's virtually impossible to make it up. The trick is to organize and plan the work so that it does not get behind.

• **Scheduling operations**—Pours are scheduled a month in advance by the contractor's engineering department. But, of course, just making a list on paper doesn't get the concrete in.

From the monthly schedule, the

(*Continued on page 45*)

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Concrete is the economical pavement for two-lane federal, state and county roads as well as for heavy-duty highways. Rigid concrete pavement is moderate in first cost yet can be designed accurately for any legal axle load—and it will *keep* its load-carrying capacity throughout its long service life.

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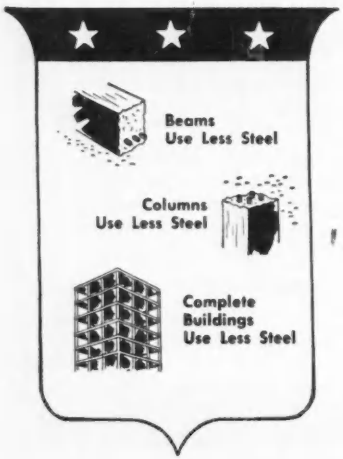

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What $58 million buys

(*Continued from page 42*)

pours are broken down on a weekly and daily basis. Formal contractor staff conferences are held weekly and others interspersed as frequently as needed. A complex model is located in the contractor's office so that all of the supervisory people can see just how the job stands and where an individual pour will go.

To complete the work, a 2,000-cu yd-a-day average will have to be maintained. With the largest pour possible only 1,500 cu yd, the difficulty of this schedule can be seen. In fact, on some days the contractor has made 9 or 10 pours and only netted 200 cu yd of concrete in place.

Next in importance to knowing what progress must be made is the equipment for getting the concrete mixed and to the proper place. The concrete plant has four 4-cu yd mixers and, in general, has standard equipment. But there are more than 7 mi of railroad track on the job for moving concrete by ten dinky engines and otherwise servicing the project. Concrete is placed by nine large size whirley cranes. Most of these are mounted on four sets of tracks, each 1,500 ft long paralleling the powerhouse. Three pours are generally kept under way at all times.

The contractor has done all possible to standardize forms. Uniform size panels are used where practicable and standard form bolt spacing is used.

All forms are faced with tongue and groove lumber. Between pours they are remodeled for the next pour, with the form faces sanded and coated with form oil. Because all 12 remaining ¡ verhouse units will be going up at once, re-use possibilities are limited.

The same holds true for reinforcing steel. Column steel is pre-fabricated in assemblies but most of the other steel must be hand-placed on the job.

• **Organization**—Of equal importance with the equipment is the organization for doing the job. At the peak of employment this winter and next spring there will be 3,600 men at work. These men are divided on a three-shift basis with the day shift working 8 hr for 8-hr pay, the swing shift working 7½ hr for 8-hr pay, and the graveyard shift working 7 hr for 8-hr pay. In late summer when only 2,500 men were on the job, there were about 1,400 on day shift, 600 on swing and 500 on graveyard shift.

An efficient organization is necessary to administer these thousands of men effectively. For that reason, the contractor has given much thought to his organizational setup. The various supervisors are of necessity given considerable latitude and authority over the men and the work.

SCALE MODEL will help John J. Morton, project manager (left) and Grant P. Gordon, job sponsor, keep track of the work as it progresses. It will also help other supervisors on the contractor's staff visualize work that must be done. Model will be built piece by piece as job progresses.

The accompanying organization chart is broken down only to the various superintendents. Some of these supers have a considerable and involved working force under them. For example, in late summer under the carpenter superintendent there were 13 supervisors, 36 foremen, 600 carpenters and 125 laborers. This staff has been increased by about 50%.

At the same time the reinforcing steel superintendent had working under him 10 supervisors, 19 foremen and 141 workmen. This staff has since doubled. The concrete crew under the concrete superintendent included 5 supervisors, 15 foremen and 125 workmen and this staff has also doubled.

• **Materials procurement**—Effective materials purchasing is of equal importance to the success of this contract as the personnel organization and equipment used. That would be true under normal circumstances but is even more so under the present controlled materials setup.

The entire job involves something like 73,000,000 lb of reinforcing steel. Sizes range up to 2-in. square bars. This steel is procured from five different mills and the purchasing department must see that deliveries are scheduled so as to keep the job running smoothly.

Some items are difficult if not impossible to procure. For example, one item involves a considerable quantity of machine work for stoplog gate guides. Under the best schedule offered by outside steel fabricators it would have taken 13½ yr to plane the steel for the guides. This, of course, was impossible and the contractor virtually had to set up its own installation to accomplish this work.

As was stated earlier, McNary is a contributory defense project. Much defense planning in the Pacific Northwest is dependent on first power delivery in 1953 and subsequent completion of all unit installation by December 1956. For that reason, all of the steel requirements of the job have been certified by DEPA. But even with that certification, the contractor's and materials suppliers do on occasion run into snags. When this happens, the Corps of Engineers is advised and it steps in to expedite procurement of the items needed.

• **Credits**—Staff organization for McNary Dam Contractors is shown on the accompanying table.

The project is under the jurisdiction of the Walla Walla District, Corps of Engineers, Col. William H. Mills, district engineer. Sam Neff is resident engineer for the Corps of Engineers. Design work is accomplished by the Walla Walla District, Corps of Engineers. James E. Reeves was engineering division chief until June 30, 1951, when he was succeeded by Edwin C. Franzen.

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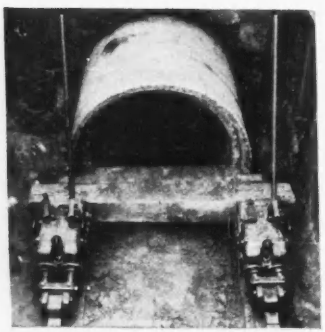

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AIRVIEW OF SARNIA—In the foreground are some of the city's larger oil refineries and chemical plants. The St. Clair River with Port Huron is shown in the left background. The Blue Water Bridge connects the two cities, while Lake Huron stretches to the horizon.

Sarnia, Canada's fastest-growing city

In the last 10 years the population of Sarnia, Ont., just across the St. Clair River from Port Huron, Mich., has increased by 84 percent, and is now 40,000. The city owes its growth to the development of many chemical industries there.

Currently there is some $40,000,000 in industrial expansion going on in the city, and the plans of oil and chemical companies for the next few years will more than double that amount.

The expansion is due to both peacetime and defense chemical developments. It also ties in with oil development in Alberta province, more than 2,000 miles distant. Oil from new fields there is now piped 1,200 miles east to Superior, Wis., and thence shipped by lake tankers to Sarnia where a number of Canadian oil companies have refineries and the Canadian government operates a synthetic rubber plant started there during World War II.

• **Municipal problems**—Municipal authorities in Sarnia are facing a big task in keeping abreast of service requirements of the expanding industry and population. An addition to the main hospital costing almost $2,000,000 is now under construction. New schools have been built and two more costing almost $1,500,000, are now under construction. Building permits in 1950 totalled 398 with a value of $2,308,306, and in the first half of this year numbered 551 with a value of $3,600,000. In the whole of 1950 permits for only 11 houses were issued. In the first six months of 1951 permits for 296 houses were issued.

Early in 1951 Sarnia added about 10,000 acres to its area, to allow for ample growth. There are a number of housing developments under way in the area, and new marine freight sheds have been built recently along the St. Clair River and Lake Huron waterfront.

Sarnia produces salt from big salt beds below the city, has factories making automotive parts, plumbing equipment, insulation materials, farm machinery, pleasure boats and building materials. The city also has a number of grain elevators. It is a railway center, with mainline trains from Toronto and Montreal going through Sarnia to Chicago.

Cut asphalt content of rubber paving

IN AN EFFORT to speed the day when they will have conclusive evidence of the effect of rubber on bituminous paving, the county road surveyors of Somerset, England, have laid test sections of paving in which considerable reductions were made in the amount of asphalt going into the mix. As such a reduction normally shortens the life of the surfacing, the road surveyors hope that by this means some definite conclusions as to the effect of the rubber can be obtained within three or four years instead of seven or more years, which is the normal life of such surfacing in that area.

(*Continued on page 48*)

RIGHT-ANGLE
ROLLER ENDS, precisely square to avoid end-rub, oscillation and side-shock.

RIGHT-ANGLE
BEARING SURFACES with parallelism that results in unwavering rightline rolling.

RIGHT-ANGLE
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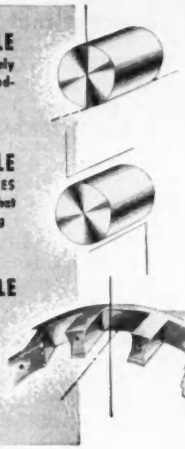
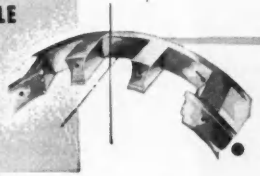


Made *RIGHT*...



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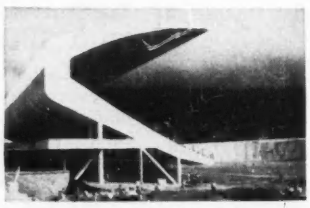
Three test sections were laid on the Bridgewater-Glastonbury road near Ashcott, each being a half-width of the pavement. The first, 108 paces long, contained 11¼ gal of binder per ton, plus 5 percent (to binder) of rubber powder. The second, or control section (67 paces), contained only 10 gal of binder and did not have any rubber added. A third section (63 paces) had the bitumen content similarly reduced but had 5 percent of natural rubber powder added.

The powder was added to the aggregate in the mixer and agitated about 10 sec before the binder was put in.

Even less bitumen was used in three test sections put down on the Minehead-Taunton road near Combe Florey. Bitumen contents were 4 percent for the normal surface and control sections and 3 percent for the section deficient in bitumen. Rubber powder in the two sections containing rubber was 5 percent by weight of binder.

Rain was falling during the laying of these test sections but no lack of adhesion to the old surface was found.

Concerning laying in the rain, A. R. Smee, road consultant of the British Rubber Development Board, says that this was not undertaken deliberately but was due to the consistently bad weather conditions prevailing at the time. He adds that no present claims are being made that the addition of natural rubber will improve adhesion in a surface laid under conditions of rain, but in similar work in Leeds it was found that the coating of chippings then being put down did adhere well.



SUPER SPORTS PLANT—The government of Venezuela recently completed this $10,000,000 sports plant to be ready for the "Bolivarian Games" participated in last month by six South American countries. More than 1,000 boy and girl athletes from Bolivia, Peru, Ecuador, Colombia, Panama and Venezuela took part. The picture shows the cantilever design of the rear of the Olympic Stadium at Caracas (ENR Jan. 11, 1951, page 52). The cantilever roof is 125 ft wide and 350 ft long. The plant also includes a baseball stadium seating 40,000, a tennis stadium for 4,000, and other sports facilities.

Columbus has $120-million master plan

A $120-million master plan for Columbus, Ohio, (population, 374,770) for the immediate and more distant future was unfolded by Mayor James A. Rhodes at his third-term inaugural last month.

A $20-million postwar civic improvement program for Columbus has just been completed and the program for the years 1953 to 1960 is estimated to cost $102,875,000. Discussing this multi-million-dollar program, the mayor outlined its ten major points as follows.

• **Housing**—Action is to be taken at once to accept $22 million worth, 2,200 units, of federal housing for low-income groups.

• **Urban redevelopment**—A $7-million slum clearance program is ready to start this month.

• **Expressways**—Harry H. Turner has been appointed expressway expediter, and work will begin at once. It will involve eventually $37 million in city, state and federal money.

• **Off-street parking**—A fund of $500,000 is available to buy property as the first step in an $8-million program to carry out recommendations already made by a committee appointed for that purpose.

• **Hoover Dam**—This $15-million project for the water supply of Columbus will start within the next six months.

• **Airport**—Ground will be broken within two months to start a $9-million expansion of the Port Columbus airfield.

• **Health and safety center**—Within 30 days work will be started on this structure to house the city health department.

• **Streets**—About $2,500,000 will be spent on streets in 1952, on top of the $10 million worth done in the last six years.

• **Street lights**—There will be no dark corners in Columbus. During the last two years $1 million was spent on street lights. Another $1,500,000 will be provided.

• **Municipal Zoo**—A new $750,000 program is planned for this institution.

• **Other plans**—Referring to administration proposals for the coming years of 1953 to 1960, Mayor Rhodes spoke of the elimination of 17 grade crossings, expansion of sewerage facilities, the addition of $1 million worth of new parks, and $1 million for six more firehouses, which will begin in 1953.

Columbus council acts to implement plan

Immediately after Mayor Rhodes' announcement concerning the $120-million master plan for Columbus described above, the city council gave the "go ahead" signal for civic improvement programs involving expenditures of $67 million or more of this amount, $37 million is for the expressway system.

The Metropolitan Housing Authority was authorized to proceed with the $22-million project for 2,200 low-cost housing units.

An ordinance was passed to create a Department of Motor Vehicle Parking to supervise off-street parking facilities to cost an estimated $8 million.

Councilmen also approved legislation to provide for a commissioner of urban development to expedite that program in conjunction with the expressways and federal housing.

Speed-up orders also were issued regarding the Port Columbus improvement, and the council declared its intention to set aside three parcels of land along Big Walnut Creek for a dam site and a fourth parcel for a third city waterworks.

High court upholds law abating lake pollution

MADISON, WIS.—A state supreme court ruling has upheld circuit court judgment that compels this city to divert its sewage plant effluent from lakes south of the city.

Legislation passed in 1949 prohibits discharge of effluent from a primary or secondary treatment plant of a city with 45,000 or more persons into lakes 2 to 6 sq mi in area within 10 miles of the plant. Madison is the only Wisconsin City affected by the law, and the Metropolitan Sewerage District unsuccessfully challenged it as unreasonable and unconstitutional.

Madison must now divert its effluent to reduce allegedly nuisance-producing algae blooms on local lakes. Employment of a consultant to devise the best diversion scheme has been authorized. Construction needed is estimated to cost up to $4 million. Inorganic nitrogen and phosphorous in treatment plant effluent is credited with causing the algae.

Much housing unfit says Philadelphia survey

PHILADELPHIA, PA.—One-third of the dwelling units in some of the older sections of Philadelphia are unfit for habitation. That's the conclusion that was reached after a survey of the area, sponsored by the City Planning Commission, the Redevelopment Authority and the Housing Authority.

A rpeort, "Housing Quality Survey," issued last month by the group blames building codes, zoning regulations and poor enforcement of the law.

The extent and character of the substandard conditions found affects the lives of thousands of families adversely. Also, they threaten to undermine the foundations of the municipal financial structure, the report says.

To remedy this condition, a review of the entire field of enforcement of housing and building regulations is recommended, as well as a restudy of the basic legislation itself. In addition, full utilization will have to be made of city, state and federal aid for slum clearance, urban rehabilitation and public housing.

The study was made under the supervision of Jack Dunn, planning analyst of the City Planning Commission. The American Public Health Association acted as consultant, and the Division of Housing and Sanitation of the Philadelphia Department of Public Health assisted in the field work.

In evaluating conditions in the neighborhoods studied, the health staff used an appraisal method developed by the Committee on Hygiene of Housing of the APHA.

San Diego closes channel because of boat mishaps

SAN DIEGO, CAL.—The City Council has closed to navigation, the channel into its $24-million Mission Bay Aquatic Park following a series of boat accidents in which eleven persons drowned.

The waterway is part of a project sponsored by the city, the state, and the Corps of Engineers to turn Mission Bay into an Aquatic Park (ENR Jan. 18, 1951, p 45). A separate paralelling flood channel is provided for the San Diego River.

The river formerly emptied directly into the bay and silting had created a hazardous flood condition. Levees out into the ocean form the flood channel mouth. A new mouth of the bay was dredged adjoining the channel to the north. However, only a narrow pilot channel was dredged. It has silted, and when combined with an ebb tide, creates the danger to boating.

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NOW pile foundations are explained from A-Z—with tested methods for their design, installation, maintenance, and repair—in this new handbook on their safe, economical, and effective construction. It covers everything from soil mechanics and load testing, selection of rigs and equipment, pile design and driving—to methods for preventing decay and corrosion of piles, and means for insuring against pile-foundation failures. Recent advances are included such as diesel hammers, prestressed concrete piles, drainage, and Prepakt concrete. Includes a 200-page appendix giving many useful data, examples, test studies, specifications, etc.

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MEETINGS

ACHIEVEMENT AWARD—Stephen D. Bechtel receives the 1951 Achievement Award of the Building Industry Conference Board of Northern California. Standing behind Mr. Bechtel are, left to right: Charles J. Nicholas, chairman of the board, J. G. Wright, chairman of the award committee, and Ralph Tudor who had just presented an honorary posthumous award for Charles H. Purcell, late California Director of Public Works.

State group approves planning bill

The Maryland-National Capital Park and Planning Commission has approved provisions of a proposed bill to reorganize the National Capital Park and Planning Commission.

Under the bill expected to be introduced in Congress this month a regional planning council would be named with representatives from the District of Columbia and from planning groups in nearby Maryland and Virginia to work toward development of regional planning.

CALENDAR

American Society of Photogrammetry, annual meeting, Shoreham Hotel, Washington, D. C., Jan. 9-11.

Kansas Contractors Association, annual meeting, Hotel President, Kansas City, Mo., Jan. 10-11.

N. Y. Section, American Water Works Assn., winter luncheon meeting, Hotel Park Sheraton, N. Y., Jan. 15.

Highway Research Board, annual meeting, National Academy of Science Bldg., Washington, D. C., Jan. 15-18.

N. Y. Sewage and Industrial Wastes Assn., annual meeting, Hotel Statler, N. Y. City, Jan. 17-18.

National Association of Home Builders, Stevens and Congress Hotels, Chicago, Jan. 17-24.

Canadian Construction Association, annual meeting, Royal York Hotel, Toronto, Ont., Jan. 20-23.

National Association of Home Builders, annual convention and exposition, Conrad Hilton and Congress Hotel, Chicago, Jan. 20-24.

American Road Builders Association, Golden Anniversary, Rice Hotel, Houston, Tex., Jan. 21-24.

Wisconsin Highway Commissioners and Highway Committee Members Association, winter conference, Schroeder Hotel, Milwaukee, Jan. 22-24.

Associated Equipment Distributors, Conrad Hilton Hotel, Chicago, Jan. 27-31.

American Society for Metals, William Penn Hotel, Pittsburgh, Pa., Jan. 31-Feb. 1.

California Conference on Street and Highway Problems, University of California, Los Angeles, Feb. 6-8.

National Council of Private Motor Truck Owners, convention, Hotel Statler, Washington, D. C., Feb. 7-8.

National Sand and Gravel Association, and National Ready Mixed Concrete Association, convention and exposition, Conrad Hilton Hotel, Chicago, Ill., week of Feb. 11.

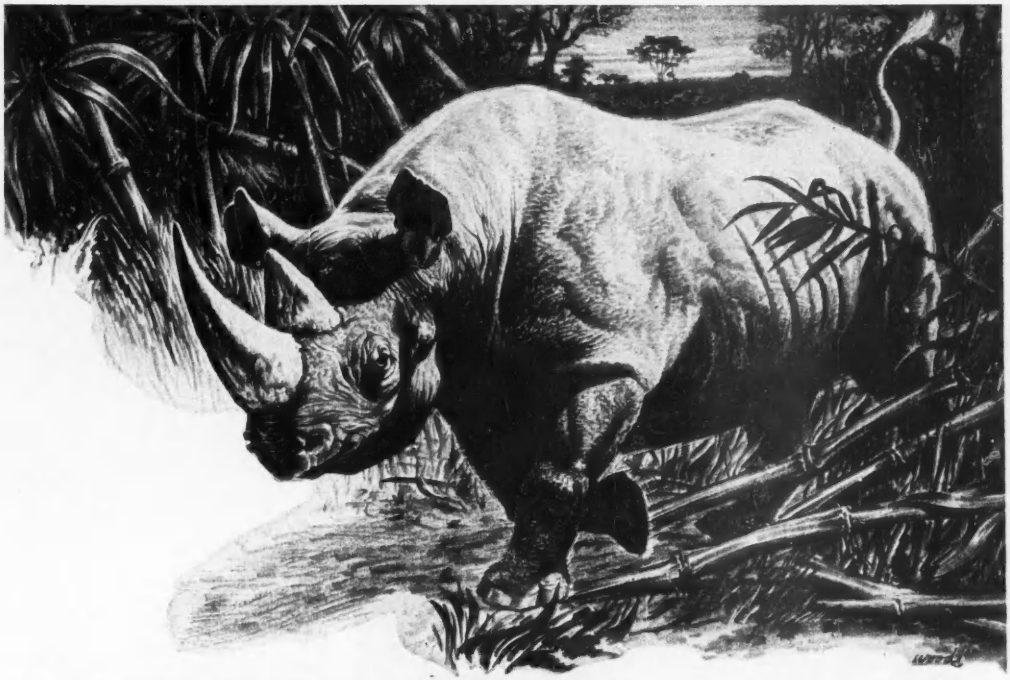
Illinois annual Conference on Highway Engineering, Urbana, Feb. 19-21.

N. Y. State County Highway Superintendents Association, DeWitt Clinton Hotel, Albany, Feb. 20-22.

Associated General Contractors of America, Statler Hotel, Detroit, Feb. 25-28.

Materials Handling Conference, Purdue University, LaFayette, Ind., Feb. 25-26.

American Concrete Pipe Association, annual convention, Drake Hotel, Chicago, Ill., Feb. 28-March 1.



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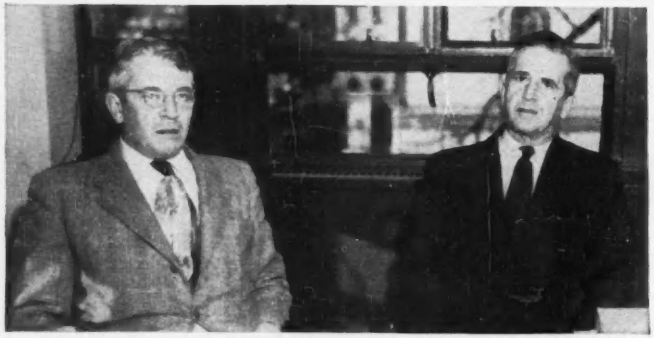


CHANGES IN NEW HAMPSHIRE—Left, Maj. Gen. Frank D. Merrill, New Hampshire Commissioner of Public Works and Highways, who has returned to active duty with the Army at Washington; right, John O. Morton, deputy commissioner, who was promoted to acting commissioner by Gov. Sherman Adams for the duration of General Merrill's absence.

RETIRED DEAN SITS FOR PORTRAIT—Prof. Dexter S. Kimball, retired dean of the College of Engineering at Cornell University and former president of the Society for the Promotion of Engineering Education, sits for a portrait by Thomas E. Stephens of New York. A gift of Cornell Alumnus and trustee Walker Cisler, president of Detroit Edison Co., the portrait will be hung in a Materials Processing Laboratory named for Kimball, which is now under construction on the campus. Professor Kimball, 85, is a graduate of Stanford University, 1896. He joined the Cornell faculty in 1898 and in 1920 became the first dean in the College of Engineering, and continued for 16 years until his retirement in 1936.

New appointments

Bureau of Reclamation

These engineers to direct construction of the Palisades Project in Eastern Idaho have been appointed: **Louis B. Ackerman,** construction engineer; **Henry Patrick O'Donnell,** field engineer; and **I. Donald Jerman,** assistant to the construction engineer, in charge of construction and land acquisition in the reservoir.

Engineering schools

H. Russell Bintzer is assistant to the president and director of the $5,000,000 development program at Drexel Institute of Technology, Philadelphia.

Corps of Engineers

Col. Paschal N. Strong is now chief of the United States Engineers, Ohio River Division, at Cincinnati.

C. H. Lang to expedite New York Thruway

ALBANY, N. Y.—Appointment of Conrad H. Lang, of Troy, an R.P.I. graduate, as deputy chief engineer for the New York State Thruway Authority was announced last week by Authority Chairman Bertram D. Tallamy.

The appointment is effective Jan. 1, following Mr. Lang's transfer from the Utica district office of the State Department of Public Works, where he has been serving for the last nine months as assistant district engineer.

Mr. Lang will coordinate and expedite the design and construction of the Thruway, its bridges, overpasses and grade separation structures. He has been with the State Department of Public Works for 25 years. He was for seven years assistant to E. W. Wendell, deputy chief engineer in charge of bridges, grade separations, and structures.

Honors

Commendation for outstanding performance in the production of safe and potable water was conferred on three waterworks authorities by Northwestern Technological Institute at the Northern Illinois Waterworks Institute. They are **Harry E. Jordan,** secretary, American Water Works Association; **W. W. DeBerard,** city engineer; and John R. Baylis, chief filtration engineer, both of Chicago.

G. R. Wellington, has retired as chief of the section of safety, Bureau of Motor Carriers, Interstate Commerce Commission. He served for 15 years as chairman of the National Committee on Uniform Traffic Laws and Ordinances and was a member of the executive committee of the commercial vehicle section, National Safety Council.

Another retiring traffic safety expert was also honored recently. He is **Julien H. Harvey,** called the father of the "Three E's of Safety"—education, enforcement and engineering. Since 1938 he has been manager of the accident prevention department of the Association of Casualty and Surety Companies.

Resignations

J. C. Baker, Arkansas highway director has resigned and Chief Highway Engineer Alfred Johnson is acting director.

Leo Ehlinger has resigned as district engineer for the Texas state highway department at Brownwood.

OBITUARY

Walter W. Colpitts dies, railroad expert

Walter William Colpitts, 77, consulting engineer and senior partner of Coverdale & Colpitts, New York City, died at Princeton, N. J., Dec. 23. A graduate of McGill University, Montreal, 1899, he began with the Canadian Pacific Railway and later was assigned to the construction department.

In 1901 he became assistant chief engineer of the Kansas City, Mexico & Orient Railway, later part of the Santa Fe system, and became chief engineer. Subsequent to 1909 he was a pioneer in the use of reinforced concrete. He wrote one of the earliest textbooks on the design of reinforced concrete structures for railways.

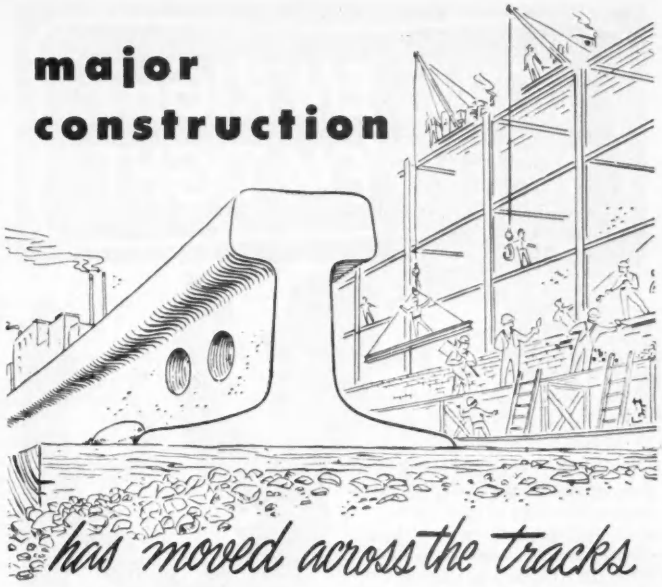
It was in 1913 that Mr. Colpitts joined the late Wm. H. Coverdale to form the well-know partnership. He helped carry out many railroad reorganizations, including that of the M. K. & T., the Pere Marquette, and the Milwaukee Road, the unification of the Nickel Plate, and a study of the operations of the Mexican National Railways for the bondholders' committee. From 1938 to 1943, he was chairman of the reorganization committee of the Minneapolis & St. Louis R.R., acting for his firm as reorganization manager.

Ralph H. Chambers dies, a foundation specialist

Ralph Hamilton Chambers, 80, who designed the foundations for many N. Y. City skyscrapers, died at the Engineers Club, New York, Dec. 22. He was a retired vice-president and director of the Foundation Company. He was a C. E. graduate of Rensselaer Polytechnic Institute, 1893. He began as an assistant engineer for the Troy, N. Y. water system. For five years he was with the King Bridge Co. In 1935 he designed the caissons that were added to the foundation of Trinity Church after it was discovered that the tower was leaning five inches a year toward Wall Street on account of inadequate foundations put in when the tower was built 116 year ago.

Wallace H. Puckett, 68, senior vice-president of the Morrison-Knudsen Co. Inc., international construction and engineering firm, died at Portland, Ore. Dec. 16. Mr. Puckett was a veteran construction man. He directed many of the reclamation

(*Continued on page 54*)



Under normal conditions — as a key fabricator of steel for virtually every structural purpose . . . from schools to skyscrapers, stadiums to storage tanks . . . from warehouses to places of worship — the first interest of International Steel is the growth of communities it serves.

But today's tense conditions have demanded drastic changeovers from normal production. New plants to speed national mobilization — new housing for combat aircraft — new structures for research — these represent the biggest "rush order" now to be filled by America's builders. Until completion of this prime contract, major construction — and a large percentage of International's productive capacity — are necessarily concentrated on the non-civilian "side of the tracks."

However, International still has — still fully recognizes — a responsibility to the civilian customers with whom it has grown. So whatever your steel building problems — look to International first. You'll find us always ready — ever willing — and usually able to help.

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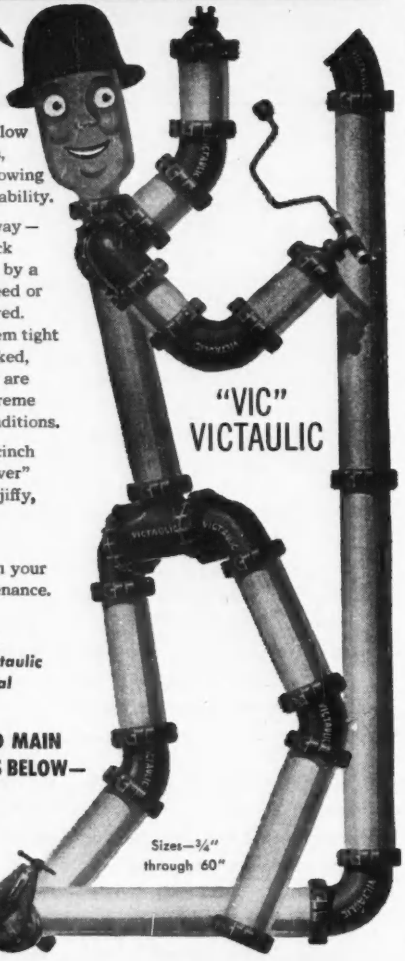

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Obituary . . .

projects in the West, and he built logging roads and highways in Oregon, Idaho and the Southwest.

Mr. Puckett joined the M-K company in 1923 through the W. H. Puckett Co. which in 1928 was merged completely with M-K. Laterly he had been in charge of construction for the Idaho Power Co., including four dams and five powerhouses.

Charles F. Smith, 70, president of the Smith Engineering Works, Milwaukee, died December 10 at Pasadena, Calif., where he had gone early in November for his winter vacation. He had been head of the company for 35 years, and had built it from a small manufacturer of a single gyratory crusher into an outstanding position in the construction quarrying and mining machinery field. Mr. Smith was also a vice president of the Sterling Wheelbarrow Co., West Allis, Wis., at the time of his death.

Allan M. Hirsh, 73, senior founder and for a long time president of the Lock Joint Pipe Co. died at Newark, N. J., Dec. 22. He was Yale 1901.

Fred F. Ellis, 83, one of the oldest road builders in the country, died at Laconia, N. H., Dec. 14. He was graduated from the Massachusetts Institute of Technology in 1888 and engaged in bridge and railroad engineering and construction of over 100 highways in New York State and New England. For 10 years he was superintendent of public works and city engineer at Melrose, Mass. He was at one time a director of the American Road Builders Association.

Alfred Minor O'Neill, 74, former deputy superintendent of public works of New York State, died Dec. 13 in Albany. He entered state service in the office of the superintendent of Public Works in 1899. He later became assistant deputy superintendent and upon completion of the N. Y. Barge Canal he took active part in planning the organization for operation of that waterway.

Wm. F. Brown, 82, for 50 years engineer of Chatham County, Ga., and builder of the Tybee Road, died at Daytona Beach, Fla., Dec. 8. He retired in 1945 after 56 years of county employment. The Tybee Road is the final link in transcontinental U.S. Highway 80 from San Diego, Calif., to South Carolina. Its construction was difficult as in some places the muck was 15 ft deep. At the Bull River crossing 75-ft piles had to be driven to support a bridge.

AEC panel forecasts better labor relations

In an optimistically worded report to President Truman, the Atomic Energy Labor Relations Panel said last week it saw an "increasing awareness" on the part of both management and labor of the need for swift, uninterrupted construction on AEC installations.

The panel said that between June 1 and Dec. 1 it had closed out nine cases, held two others still open. "For the first time," the report added, "construction required a large amount of the panel's attention. Five of the 11 cases involved construction—two involved long stoppages before coming to the panel's attention.

Emergence of the panel as a factor in the settlement of construction disputes was an interesting fact to labor observers. Set up in 1949 with the particular mission of handling disputes within the AEC's own work force, the panel's jurisdiction in construction matters has long been questioned by AFL union leaders.

Richard Gray, head of the AFL's Building Trades Department has repeatedly denied that the construction trades have any part in the panel's work (ENR Nov. 8, 1951, p. 24) since these unions were not a party to the code under which the panel operates, and were not asked to sign any pledges of compliance with the panel directives.

The panel, however—under direction of William H. Davis—has taken the position that it will act if matters are referred to it by the disputants, who must also agree to abide by decisions rendered.

Commenting on its activity in the construction field, the panel report said:

"Until lately, the building of new plants did not have the same urgency as did production in the existing plants. But since the start of the Korean action, the construction of new facilities has greatly increased, and the urgency of the building program has at least equalled that of the production program."

NLRB demands proof in discrimination case

National Labor Relations Board officials did a little fast arithmetic recently in ruling against an employer for discriminatory hiring.

The case involved the Whittenberg Construction Co. and the Paducah Building & Construction Trades Council. Fifty men had sought employment with Whittenberg—34 of them AFL members, 16 of them members of the International Association of Machinists, which was then an independent union.

None of the IAM men were hired—the company saying that this circumstance was "mere coincidence."

Said NLRB: Such a coincidence is theoretically possible—but the mathematical chance of it happening is one in five trillion.

And the board ruled that the company had "tacitly" entered a closed-shop agreement, in violation of law. Company officials argued that they had instructed the hiring foreman to employ men without regard to race, creed, color and without inquiry as to labor union membership.

Labor briefs . . .

• **Buffalo carpenters up**—Wage scales for carpenters engaged in residential construction will go to $2.55 an hour May 1, by virtue of a WSB-approved 5-cents-an-hour boost. The raise comes on top of a 15-cent-an-hour raise Nov. 1, which—together with the latest—brings the rates up from $2.35 an hour. The rate on industrial construction in the area remains at $2.70 an hour.

• **Protest steel shipments**—Protesting the shipment of $4 million worth of steel ingots to Great Britain by a Seattle firm (in exchange for other materials) the Seattle, Wash., Building and Construction Trades Council has called for closer coordination in allocation of such materials. "The building tradesman," said the council, "cannot reconcile the fact that he has been 'displaced' (because of rigid restrictions) when shipments of steel are being made to other foreign countries."

• **Insurance rates up**—The Massachusetts Workmens Compensation Rating and Inspection Bureau has filed a general revision of workmens' compensation insurance rates, effective Dec. 1, 1951, raising manual rates for the construction industry from 12% to 34%. Contractors—through the Massachusetts Chapter of AGC—have protested vigorously.

• **Up with cost of living**—Building tradesmen in the Seattle area, whose wages are tied to the cost of living indexes of the U.S. government, will receive wage raises of from 8 to 14 cents an hour as of Jan. 1.

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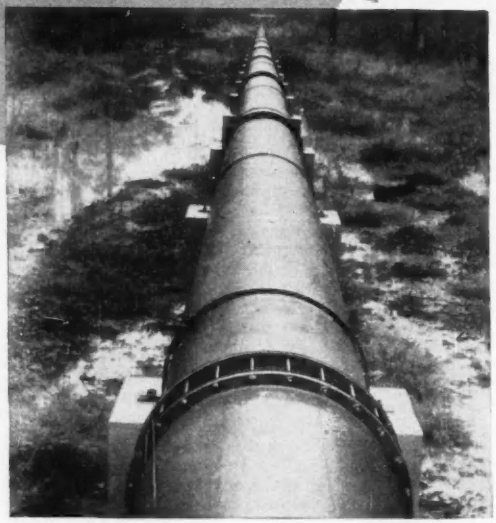
Water supply lines frequently must cross marshy or unstable ground. In such locations, steel pipe, joined with flexible Dresser Couplings, offers unusual economies.

The greater beam strength of steel pipe keeps the number of pile bents or other pipe supports at a minimum. Less cumbersome steel pipe is easier to handle—and with Dresser Couplings, the amount of heavy equipment required is small. The longer pipe sections reduce the number of field joints to be made.

Easy to install, absolutely tight, Dresser Couplings speed pipe joining, absorb normal expansion-contraction stresses, and guard your line against possible infiltration of polluted ground water through joints should internal line pressure drop. Joining crews are small, easy to manage, and need have no special skills. Joints *stay* tight—cut maintenance to the bone.

Write today. Find out how your proposed line can "Deliver Water Cheaper".

BE SURE you get the best line at the best price. Put steel pipe and Dresser Couplings in your specifications.



In Georgia, Savannah's new 42" Dresser-coupled steel supply line crosses swampy ground on concrete cradles supported by wooden piles. Beam strength of the steel pipe kept the number of supports at a minimum. Flexibility of couplings protect line against stresses.

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UNIT PRICES BID BY CONTRACTORS

Flood control, Tex.

A soil conservation project including a flood control, detention reservoir, earthfill and embankment on the west fork of Trinity River, Texas began June 27, 1951 and was to be completed Nov. 14. U.S. Dept. of Agriculture, Soil Conservation Service awarded the contract to the only bidder, Jno. F. Buckner & Sons, Cleburne, Texas, for $36,451.10.

The owner furnished structural steel, fencing and concrete. Prevailing minimum wage rates are $1.50-1.75 an hour for skilled labor; $1.25-1.50 an hour for semi-skilled; $1.00 an hour for common labor. Job is located approximately 15 miles from a railroad.

Bid was:

Jno F. Buckner & Sons, Cleburne, Texas			$36,451
Bids: 6-12-51 Items	Unit	Quantity	Unit prices
Clearing	ac	9.0	$150.00
Clearing & grubbing	ac	16	200.00
Uncl channel exc	cy	3,000	0.50
Uncl core trench exc	cy	2,500	0.40
Spec stream channel exc	cy	500	1.00
Embankment	cy	100,000	0.24
Rolling for addnl compaction	hr	100	5.00
Pl topsoil in earth spillwy	sy	2,000	0.10
Conc cl A	cy	14.31	50.00
Class B	cy	15.9	50.00
Reinf stl	lb	1,235	0.16
F&i RC pipe, 12" ID	lf	168	5.75
F&i bit cotd galv corr sheet metal pipe, 12" ID, 14ga	lf	80	5.50
8" ID, 14 ga	lf	40	4.00
F&i 8" gate valve & cut off assembly	ea	1	125.00
F&i inlet filler blousing	ea	1	100.00
F&i metal debris guard	ea	1	100.00
F&i baffle wall fin	ea	1	85.00
Furn & install new wire fence	lf	2,350	0.22

Water; sewer lines, Mont.

Alternate prices on a 50,000-gal stand pipe vs. a 50,000-gal tank and tower; on wood water mains vs. 10 gage steel pipe, and on vitrified clay sewer vs. concrete sewer pipe featured bidding on 10,500 lf of mains and 11,000 lf of sewers at Rudyard, Mont.

Contract was awarded by Special Improvement Dists. 5 & 6, Hill Co. Comrs. for all three sections of the job to O'Connor Construction Co., Kalispell, Mont. at $70,049.80 for stand pipe, steel mains and clay sewers. This was 6% below the engineer's estimate. R. T. Hurdle & Sons, Billings, Mont. are consulting engineers.

Gate valves, fire hydrants and extra excavation vary in unit price according to the pipe material with which they were to be used. Bids on 12 ga steel pipe reduced the low bid by $800 and the next to low by $1,010 but were not adopted. Gray Company, Inc. offered cement asbestos water mains at the same price as the 10 ga steel and agreed to a reduction of $500 in the total bid if both the water and sewer sections were awarded together.

The job is right on a railroad. Work started August 1, 1951 and will be completed in 90 days. Wage rates in this area are $1.67½ an hour for common labor; $1.90 for semi-skilled labor; $2.25 for skilled labor.

Bidders were:

1C	O'Connor Construction Co., Kalispell, Mont	$70,049.80
2	Gray Company, Inc., Great Falls, Mont	70,156.00
3	E. H. Blakeslee, Great Falls, Mont	87,382.00

Bids: 7-3-51 Items	Unit	Quantity	Unit prices 1 C	2
Struct exc	cy	10	$2.00	$3.00
Fndn conc	cy	10	60.00	35.00
50,000 gal stand pipe, alt 1	ls	1	10,500.	10,500
50,000 gal tank & tower, alt 2	ls	1	.....	19,500
8" wood water mains, alt 1	lf	2,100	2.60	.....
8" 10 ga stl water pipe mains, alt 2	lf	2,100	2.83	2.97
8" gate vlvs w wood line, alt 1	ea	6	160.00	.....
8" gate vlvs w stl line, alt 2	ea	6	200.00	220.00
6" wood water mains, alt 1	lf	800	2.31	.....
6" 10 ga stl water pipe mains, alt 2	lf	800	2.38	2.38
6" gate vlvs w wood line, alt 1	ea	2	127.00	.....
6" gate vlvs w stl line, alt 2	ea	2	150.00	172.00
4" wood water mains, alt 1	lf	4,200	1.85	.....
4" 10 ga stl water pipe mains, alt 2	lf	4,200	1.85	1.83
4" gate vlvs w wood line, alt 1	ea	7	106.00	.....
4" gate vlvs w stl line, alt 2	ea	7	125.00	118.00
2" wood water mains, alt 1	lf	3,100	1.20	.....
2" 10 ga stl water pipe mains, alt 2	lf	3,100	1.20	1.21
2" gate vlvs w wood line, alt 1	ea	6	60.00	.....
2" gate vlvs w stl line, alt 2	ea	6	60.00	83.00
Fire hydrants w wood line	ea	10	225.00	.....
Fire hydrants w stl line	ea	10	250.00	315.00
Extra exc, for wood line	cy	100	1.25	.....
Extra exc, for stl line	cy	100	1.25	0.50
12" conc sewer pipe, alt 1	lf	3,800	.....	1.60
8" VC sewer pipe, alt 2	lf	3,800	1.73	1.69
6" conc sewer pipe, alt 1	lf	8,000	.....	1.45
6" VC sewer pipe, alt 2	lf	8,000	1.45	1.58
Manholes	ea	21	275.00	330.00
Lamp holes	ea	6	60.00	25.00
Septic tank	ls	1	9,923	8,750

Water mains, Phoenix, Ariz.

Installation of cast iron water mains and fire hydrants furnished by the city of Phoenix, Arizona drew three bidders on June 19, 1951. Edward E. Tufte is civil engineer for the Public Works Department. The low bid of $115,898.31 was 1% below the middle bid and 13% below the high.

Work started July 1, 1951 and was to be completed September 15, 1951.

The job is southwest of the Grand Canal, one mile from a railway. Wages are: $2.75 an hour for a foreman; $2.50 for skilled labor; $1.90 for semi-skilled; $1.62½ for common labor.

Bidders, all from Phoenix, were:

1C	J. H. Welsh & Son Contracting Co	$115,898
2	Fisher Contracting Co	117,183
3	H. L. Royden Contractor	132,944

Bids: 6-19-51 Items	Unit	Quantity	Unit prices 1 C	2
8" CI pipe compl in pl w fittings & lead jts	lf	2,677	$4.08	$4.55
6"	lf	23,041	3.18	3.20
3"	lf	1,523	2.60	2.65
2"	lf	590	2.35	2.45
8" vlves w vlve box & cover	ea	5	141.02	135.00
6"	ea	73	88.97	95.00
3"	ea	53	55.55	65.00
2"	ea	3	45.25	50.00
10" x 6" tapping sleeve & vlve w vlve box & cover	ea	6	279.34	200.00
8" x 6"	ea	9	250.14	170.00
6" x 6"	ea	3	209.64	160.00
4" x 4"	ea	1	160.64	115.00
6" fire hydrants compl in pl	ea	48	223.30	220.00
Service connection changeovers, compl in working order	ea	20	32.22	35.00

Fast starting and on-time finishing of projects means cash dollars to contractors. And you hit the "payoff" much faster with Super-Vulcan—the pile hammer featuring rapid action and super-drive. Delivering double the number of smashing blows per minute on 25 to 35 per cent less steam, powerful Super-Vulcan puts you ahead on times costs, saves on motive power costs, too.

Super-Vulcan is tops not only for economy but for durability, compactness and ease of operation. It requires a minimum of attention, and exposed working parts simplify lubrication and maintenance. Super-Vulcan is readily adaptable for driving wood, concrete and pipe piles, steel sheeting or H beams, and it fits the same leads and uses the same accessories as the Single-Acting Vulcan.

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager — *J. A. MAHONEY, Reports* — *M. R. ROESSLER, Statistics*

MIDDLE ATLANTIC

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **E. J. Albrecht Co.,** 2626 W. 26 St., Chicago, Ill. LB $1,606,725. Wills Creek Channel Imprvt., Sect. 1, Cumberland, Md. and Ridgeley, W. Va., ENG 49-080-52-16, MARYLAND and WEST VIRGINIA. U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C. Bids Dec. 18. CD 11/23.

BUILDINGS

LOW BIDS AND CONTRACTS

▲**Sun Oil Co.,** 1608 Walnut St., Phila., Pa., Own Forces. Est. $20,000,000. AROMATICS PLANT, MARCUS HOOK, PA. CD 5/1.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

La., Shreveport—B.A. 1/8—City, City Hall, addns. to Cross Lake Water Pumping Station. CD 10/10.

Tenn., Memphis—B.A. 1/8—City, City Hall, sewer laterals 25,000 lin. ft., in Bunker Hill sub-division. CD 12/7/51.

† **Fla., Cocoa**—OFFICE—B.A. 1/10—U. S. Eng., P.O. Box 4970, Jacksonville, area engineer's office, Air Missile Test Center, Inv. Eng. 08-123-52-9. CD 4/4.

BIDS ASKED—BUILDINGS

† **Ga., Fort Benning**—SCHOOL—B.A. 1/11—U. S. Housing & Home Finance Agency, Glenn Bldg., Atlanta, elementary school for personnel. Plans deposit $30.

SOON LETS CONTRACT—HEAVY CONSTRUCTION

La., New Orleans—MOTOR COURT—Airline Highway Tourist Court, c/o Patrick M. Allison & Assoc., archts., 315 St. Charles St., soon lets contract motor court. CD 12/19.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Virginia Engineering Co.,** Melson Blvd., Newport News, Va., CA. $652,000. foundations for 4x4 ft. supersonic tunnel, LANGLEY FIELD, VA. National Advisory Committee for Aeronautics, Langley Field, Va. CD 12/13, under LB.

Sumter Builders, Inc., Sumter, S. C., CA. $759,580, 120.3 mi. rural distr. lines in 5 counties, SOUTH CAROLINA. Central Electric Power Co-operative, 2G Cornell Arms Bldg., Columbia, S. C. Bids Nov. 20. CD 11/27, under LB.

LOUISIANA—State Hy. Dpt., Highway Office Bldg., Baton Rouge.

T. L. James Co. Inc., Ruston, La. CA, $679,338. grading 10 mi. Thornwell-Lake Arthur Hy., State Rte. 98, Jefferson Davis Parish. Awarded Dec. 13. CD 12/6 under LB

Dorr Co., 570 Lexington Ave., New York, N. Y. CA. $395,400. Contrs. 155-W and 156-W, water treatment units at water purification plant, NEW ORLEANS, LA. Sewerage & Water Bd., 526 Carondelet St., New Orleans, La. Bids Nov. 14. CD 5/3/51.

Bob Bros. Constr. Co., 2400 Cypress St., New Orleans, La. LB $71,920, Proposal No. 19, 559 wid'n., conc. and asph. paving Gravier St. from Saratoga St. to Claiborne Ave., LB $77,449, Proposal No. 19, 560, wid'n., c. conc. and asph. paving Perdido St. from Saratoga St. to Claiborne Ave.;

Mike Cullen, New Orleans, La., LB $76,132. Proposal No. 19, 561, subsurf. drainage on London Ave. from St. Bernard to Broad Aves., NEW ORLEANS, LA. City, City Hall, New Orleans, La. Bids Dec. 14. CD 12/11.

BUILDINGS

LOW BIDS AND CONTRACTS

S. L. Johnson, 1020 Lindale Lane, Norfolk, Va., Owner Builds. $300,000. RESIDENTIAL DEVELOPMENTS, NORFOLK, VA.

English Constr. Co., Altavista, Va., LB $529,363, ACTIVITY BLDG., PETERSBURG, VA. Virginia State College, Petersburg, Va. Bids Dec. 11. CD 11/8.

Cassell Bros., Kingsport, Tenn., CA. $693,000. Pound HIGH SCHOOL, WISE, VA. Wise Co., Wise, Va. CD 11/20, under LB.

Little Constr. Co., 1205 E. Worthington Ave., Charlotte, N. C., LB $338,000. HOSPITAL addns., alterations, SANFORD, N. C. Lee Co., Sanford, Bids Dec. 12. CD 11/21.

▲ **Daniel Constr. Co.,** 429 Main St., Greenville, S. C., CA. Est. over $3,000,000. MILL, 2nd unit, SEVIER, N. C. American Thread Co., c/o contractor.

Green-Mar Builders, 5601 S. W. 76 St., Miami, Fla., CA. $300,000, RESIDENTIAL DEVELOPMENTS, HIALEAH, FLA. Gratigny Heights, Inc., c/o contractor.

Maurer Constr. Co., 46 N. E. 6 St., Miami, Fla., CA $86,690, FACTORY addns., MIAMI, FLA. American Screw & Bolt Co., 4101 N. W. 25 St., Miami, Fla.

Richardson Constr. Co., 429 S. 24 St., Birmingham, Ala., LB, $308,650, reactivation of AIRCRAFT SERVICE PITS, BIRMINGHAM, ALA. Hayes Aircraft Corp., Municipal Airport, Birmingham, Ala.

† **U. S. Eng.,** P. O. Box 1169, Mobile 7, Ala., rejected bids Aug. 15, rehabilitation of demolition area and press bldg., at Redstone Arsenal, HUNTSVILLE, ALA. Will re-advertise. CD 11/14, under LB.

Bluestein Constr. Co., 504 Baronne Bldg., New Orleans, La. CA $550,000. 66 HOUSING units, BILOXI, MISS.

Better Homes Constr. Co., Cookeville, Tenn., CA. Approx. $100,000. PLANT addn., COOKEVILLE, TENN. Wilson Athletic Goods Mfg. Co., 2037 N. Campbell St., Chicago, Ill. CD 11/8.

MIDDLE WEST

BUILDINGS

LOW BIDS AND CONTRACTS

Don M. Casto & Assoc., 145 N. High St., Columbus, O. Owner Builds. SHOPPING CENTER, 10 store bldg. in Plaza sect. of Town and Country Shopping Center, E. Broad St., east of Union Store bldg., COLUMBUS, O. C. Melvin Frank, 43 W. Long St., Columbus, O., archt.

▲ **David Muss & Norman K. Winston,** 22 W. 48 St., New York, N. Y., **Clinton Murchison, Jr., & John Murchison,** Dallas, Tex., and **Cowan Constr. Co.,** Shawnee, Okla., CA. Approx. $10,000,000. construct, manage, finance, (2nd unit) 1,000 HOUSING units at Wright-Patterson Field, DAYTON, O. U. S. Eng., 830 W. Broadway, Louisville 1, Ky.

Roediger Constr. Co., 1737 Euclid Ave., Cleveland, O. CA Approx. $400,000. 2 story, brick Elementary SCHOOL and CONVENT, PARMA HEIGHTS, O. Sisters of the Incarnate Word & Blessed Sacrament, Mother Mary Brendan, Superior General, 6618 Pearl Rd., Parma Heights, O. John E. Miller, Swetland Bldg., Cleveland, O., archt.

▲ **James Leck Co.,** 211 S. 11 St., Minneapolis, Minn., LB, $967,100, general contract;

W. H. Dreves, 216 S. 2 St., Elkhart, Ind., LB, $490,406, heating, plumbing and ventilating, for 87-bed HOSPITAL addn., ELKHART, IND. Bd. Hospital Trustees, E. A. Lobler, chn., Elkhart, Ind. Bids Dec. 11. CD 1/2/4.

George Babre Co., 1015 Southeastern St., Indianapolis, Ind., CA, Est. $200,000, 2 story, 62,000 sq. ft., brick, rein.-con. WAREHOUSE and OFFICE, INDIANAPOLIS, IND. Genreal Electric Co., 326 W. Georgia St., Indianapolis, 8, Ind. Paul Cripe, Lemke Bldg., Indianapolis, Ind. engr. CD 11/27.

Glenn W. North Constr. Co., 9 and Tippecanoe Sts., Terre Haute, Ind., CA, $646,121, general constr. HOSPITAL remodeling and addn., TERRE HAUTE, IND. Union Hospital, 7 St. and 8 Ave., Terre Haute, Ind. CD 10/15.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
B.A. Bids Asked
ENR Engineering News-Record
CD Engineering News-Record Construction Daily

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† **S. D., Rapid City**—FUELING STATIONS—B.A. 1/17—U. S. Eng., 1709 Jackson St., Omaha, Neb., addnl. fueling stations at Rapid City Air Force Base, Inv. 52-38. CD 11/12.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Tetyak-Young Constr. Co., 726 E. 85 St., Kansas City, Mo. CA Est. $223,252. 2 steel pipe lines, KANSAS CITY, MO. Gas Service Co., Scarritt Bldg., Kansas City 6, Mo.

† **Richard E. Harder Contr. Co.,** 1518 Sulphur St., St. Louis, Mo. LB $99,424. Rehabilitation 8½ mi. patrol road, 9,300 R. R., clearing 9 mi. boundary fence, 30 acres of test range, Tyson Valley Powder Farm, St. Louis Ordnance Plant, ENG 23-028-13B, ST. LOUIS, MO. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Dec. 11. CD 11/1.

H. J. Sieben Constr. Co., 1809 E. 76 Terrace, Kansas City, Mo. CA $206,948. Sewers Lateral Dist. No. 49A Dist. No. 1, OLATHE, KAN. Comrs. Johnson Co., Court House, Olathe, Kan. Bids Dec. 18. CD 11/23.

OKLAHOMA—State Hy. Dpt., Capitol, Oklahoma City, Zone 5.

H. R. Landt, 2424 N. W. 12 St., Oklahoma City 6, Okla., CA. $75,132, est. $82,284, four concrete, steel bridges S. H. 51, Kingfisher Co.

Park-Ward Co., 711 N. W. 38 St., Oklahoma City 6, Okla., CA. $230,726, est. $270,751, bridge over Beaver River on U. S. 287, near Boise City, Cimarron Co. Bids Dec. 4, awarded Dec. 12. CD 11/27.

OKLAHOMA—State Hy. Dpt., Capitol, Oklahoma City, Zone 5, received no bids Dec. 4, rock asph. on stabil. aggregate surf. 2.042 mi. S. H. 77A. Carter Co. $125,786. CD 11/27.

▲ **OKLAHOMA**—State Hy. Dpt., Capitol, Oklahoma City, Zone 5,

Lyles & Buckner, Muskogee, Okla., CA. $111,185, est. $109,160, stabil. aggregate base and double bit. surf. course 7 mi. S. H. 82 through Gideon, Cherokee Co.; CA. $286,792, est. $272,749, stabil. aggregate base, rock asph. surf. 7 mi. S. H. 9 near Dustin, Hughes Co.; CA. $59,909, est. $58,887, stabil. aggregate base, double bit. surf. 2.745 mi. S. H. 82 through Gideon, Cherokee Co.;

Poston Sand & Gravel Co., Lawton, Okla., CA. $87,183, est. $110,013, grading, drainage, minor structures 5.546 mi. S. H. 51 near Cashion, Kingfisher Co.;

John Erts, 2112 N. W. 27 St., Oklahoma City 8, Okla., CA. $101,001, est. $95,950, stabil. aggregate base and rock asph. surf. 1.122 mi. S. H. 9 at Dustin, Hughes Co.;

Myron Groseclose, Bethany, Okla., CA. $123,228, est. $125,545, stabil. aggregate base, double bit. surf. mi. H. 199, Bryan Co.; CA. $71,200, est. $78,500, 5 mi. asph. stabil. base, bit. surf. course 1.25 mi. S. H. 39 at Asher, Pottawatomie Co.; CA. $134,405, est. $148,900, asph. stabil. base, bit. surf. course 8 mi. S. H. 39 west of Asher, Pottawatomie Co.; CA. $110,903, est. $118,700, asph. stabil. base, bit. surf. course 8.157 mi. S. H. 39 east of Lexington, Cleveland Co.; CA. $164,617, est. $167,707, stabil. aggregate base and double bit. surf. 6.328 mi. S. H. 199, at Kingston, Marshall Co.;

Smith Bros., Noble, Okla., CA. $240,447, est. $243,942, stabil. aggregate base and rock asph. surf. 5.927 mi. S. H. 9, McIntosh Co.; CA. $229,039, est. $232,150, stabil. aggregate base rock asph. surf. 5 mi. S. H. 9, McIntosh Co. Grand total $1,719,909. Bids Dec. 4, awarded Dec. 12. CD 11/27.

Hall Co., Memphis, Tex., Force Account. $70,000. Repairing, imprv. roads, vicinity ESTELLINE, TEX.

Colorado Co., Court House, Weimer, Tex., Force Account. $65,000, Precinct 1, some road drainage, surf.; $80,000, Precinct 2, road graveling and some drainage; $90,000, Precinct 3, road drainage and bridge; $70,000, Precinct 4, some road graveling, drainage and small bridge WEIMAR, TEX. Grand total $305,000. CD 7/17/47.

BUILDINGS

LOW BIDS AND CONTRACTS

McKinnon-Decker Constr. Co., Helena, Mont. LB $347,000. general constr. 1 story, rein.-con., tapestry brick veneer INFIRMARY and BOILER HOUSE addn., Montana State Training School, BOULDER, MONT. State Bd. Examiners, W. L. Fitzsimmons, secy., Helena, Mont. Bids Dec. 13. CD 11/29.

O'Rourke Constr. Co., Box 5385, Dallas, Tex., CA. Approx. $589,000. BAKERY PLANT, DALLAS, TEX. Mrs. Baird's Bakeries, Inc., 1401 N. Carroll St., Dallas, Tex. CD 12/18, under LB.

S. A. Taorimana, Donna, Tex., Own Forces. $90,000. Vegetable Canning PLANT, YOAKUM, TEX. CD 12/12.

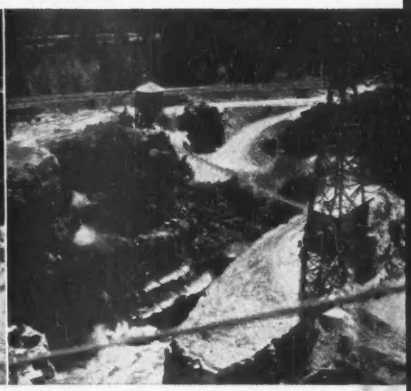
(Continued on page 60)

ENGINEERING WITH ATLAS EXPLOSIVES

ONE ROCKMASTER® BLAST dams a river gorge

1. *The sheer walls of Cabinet Gorge in Idaho rise 350 feet above the swift Clark Fork River. Morrison-Knudsen Co., Inc. had to throw a cofferdam across waters 70 to 80 feet deep—too tough a job for truck dumping or sheet piling. So M-K used explosives.*

2. *The blast starts. Nearly 65,000 pounds of Atlas Flo-dyn #4 (40% free-flowing dynamite) were used.* ROCKMASTER *millisecond delay detonators Nos. 0 to 11 were used for accurate control of throw across the river.* ROCKMASTER *timing fired forward end first.*



3. *The two lower benches move riverward —an example of how milli-second delay timing is used to throw rock to a designated spot. Vibration and overbreak were not factors in this blast, but note that the cement silo is undamaged and the footbridge remains up.*

4. *A second after detonation the front burst is over; bottom and top falling fast. This was a coyote-tunnel blast. But the multiple one-two punches of* ROCKMASTER *give the same control with well or wagon drill holes.*

5. *Water splashes high in displacement. Success was evident immediately after the blast when water started flowing through two tunnels prepared to divert stream. Atlas sales-technical men cooperated with Morrison-Knudsen.*

6. *Dust has settled. More than 90,000 cubic yards of rock, thrown directly across the stream as aimed, are ready for final grading and will serve as basis for further cofferdam installations.*

This was a *big* job. But even on small jobs you can profit by ROCKMASTER control. Find out how milli-second delay timing can work for *you*—send for free 20-page book, with diagrams, outlining the control possible with ROCKMASTER blasting.

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CROWNS—*(Any Type)*—INVERTS—UNDERCUTS

With the Jackson electric Vibratory Hand Screed (powered by a Jackson 1.25 KVA Portable Power Plant) it is possible to eliminate center construction joints and pour full widths up to 30 ft. And it is the only screed that can be rolled back (on 4 rollers) for second passes. Screed is furnished with all hardware, cable, shoes, rollers and vibratory motor attached to an 8 ft. plank. The contractor has only to provide himself with a plank of suitable length, specified crown, and then transfer the hardware to be set for any particular use. Screed has strong tendency to propel itself forward and requires only two men on any width slab. **FOR SALE or RENT at Jackson Distributors**

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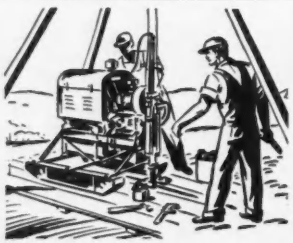

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FAR WEST

BIDS ASKED—BUILDINGS

Calif., Duarte—SCHOOL—B.A. 1/11—Duarte Elementary School Dist., Duarte, frame, stucco Andreas Elementary School, $300,000. Plans deposit $25. Allison & Rible, 625 S. Westmoreland Ave., Los Angeles, archts.

Calif., Whittier—SCHOOL—B.A. 1/16—Whittier Union High School Dist., 610 W. Philadelphia St., 1 story El Rancho High School addns. $900,000. W. H. Harrison, 816 W. 5 St., Los Angeles, archt. CD 11/9.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

ARIZONA—State Hy. Dpt., 17 Ave. and Jackson St., Phoenix.

H. J. Hagen, Globe, Ariz., CA, **$547,786**, new alignment 11¾ mi. Globe-Safford Hy. to bypass Coolidge Dam, Gila Co. CD 12/7, under LB.

▲ **ARIZONA**—State Hy. Dpt., 17 Ave. and Jackson St., Phoenix.

Daley Constr. Co., Box 1590, Phoenix, Ariz., CA, **$622,869**, new alignment 9 mi. Tucson-Nogales Highway, Santa Cruz Co.;

Fisher Contg. Co., Box 4035, Phoenix, Ariz., CA **$190,326**, rebuilding 1.5 mi. Oracle Junction-Golbe Highway, Pinal Co.;

San Xavier Sand & Rock Co., 601 W. 2 St., Tucson, Ariz., CA, **$119,707**, resurf. 10½a mi. Douglas-Rodeo Highway, Cochise Co.;

Tiffany Constr. Co., Box 6292, Phoenix, Ariz., CA, **$148,118**, rebuilding wid'n. 4 mi. baseline road, Maricopa Co. Grand total $1,081,020. Awarded Dec. 7.

City, 240 W. Huntington Dr., Arcadia, Calif. rejected bids Dec. 4, imprv. Longden Ave., 6 Ave. to Santa Anita, Wash., ARCADIA, CALIF. CD 11/13.

BUILDINGS

LOW BIDS AND CONTRACTS

McGinty Constr. Co., Luhrs Bldg., Phoenix, Ariz., CA, **$930,491**, College GYMNASIUM, Arizona State College TEMPE, ARIZ. State, Arizona State College, Tempe, Ariz. Bids Aug. 22, awarded Dec. 7. CD 12/7, under LB.

Crown Constr. Co., 1321 S. La Brea Ave., Los Angeles, Calif., CA, **$409,640**, 1 story, brick Newman SCHOOL, CHINO, CALIF. Chino School Dist., Chino, Calif. Kistner, Curtis & Wright, 816 W. 5 St., Los Angeles, Calif., archts. Awarded Dec. 7.

▲ **R. J. Erwin**, 124 S. Atlantic Blvd., Los Angeles, Calif., CA, **$1,031,700**. 120 frame, stucco DWELLINGS, Plumask, Behrens, Leibacher and Flatbush Aves., NORWALK, CALIF. Airport Acres, Inc., 124 S. Atlantic Blvd., Los Angeles, Calif. Wm. Bray, 5670 Wilshire Blvd., Los Angeles, Calif., archt.

Harvey & Rose, 11 N. 5 Ave., Arcadia, Calif., CA, **$629,655**, constr. Phillips Blvd. and Alcott SCHOOLS, POMONA, CALIF. City Bd. Educ., 605 N. Park Ave., Pomona, Calif. Bids Dec. 6, awarded Dec. 13. CD 12/11, under LB.

▲ **Western Area Housing Co.**, (sponsor) 1020 9 Ave., San Diego, Calif., CA, **$5,000,000**. construct, manage and finance 895 HOUSING UNITS at Kearsey Mesa, SAN DIEGO, CALIF. P. Wks. Officer, 11 Naval Dist., San Diego, Calif. CD 8/22, under LB.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

Ont., St. Catherines—B.A. 1/7—E. M. Snetsinger, 145 King St., sewer and water system for Grantham Twp., 145 King St., St. Catherines, Ont. William White, 145 King St., associated with Dinee, Philips & Roberts, 14 Carlton St., engrs. CD 1/8.

BIDS ASKED—BUILDINGS

Que., Mount Royal (Postal Dist. Montreal)—APARTMENT—Bids Asked—F. Sure, 42 Vivian Ave., Mount Royal, Que., 4 story, bsmnt., 56 suite, concrete, brick apartment, Lombard Crescent, $300,000. L. N. Booth, 3110 Van Horn Ave., Montreal, Que., archt.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Pearson Constr. Co., Ltd., 1019 Erin St., Winnipeg, Man., CA, **$43,588**, water storage reservoir;

Harris Constr. Co., Ltd., 1350 Wall St., Winnipeg, Man., CA, **$115,990**, water and sewer services at Camp, WINNIPEG, MAN. Govt. of Canada, Dpt. National Defence, Cartier Sq., Ottawa, Ont. Defence Construction 1951 Ltd., 70 Lyon St., Ottawa, Ont., engr.

Ashfield Bros., Ltd., Fredericton, N. B., CA, Approx. **$100,000**., water and sewerage system at R.C.A.F. Station, GREENWOOD, N. S. Govt. of Canada, Dpt. National Defence AIR, Cartier Sq., Ottawa, Ont., Central Mortgage & Housing Corp., 70 Lyon St., Ottawa, Ont., engr.

Couvier & Keyes Constr. Co., Chandler, Que., CA **$130,405**, wharf, CHANDLER, QUE. Govt. of Canada, Hunter Bldg., Ottawa, Ont.

BUILDINGS

LOW BIDS AND CONTRACTS

Poole Constr. Co. Ltd., 2402 2A St., Calgary, Alta., CA $110,000. WAREHOUSE, EDMONTON, ALTA. H. R. MacMillan Sales (Alta.) Ltd., 12215 127 Ave., Edmonton, Alta. Bids Nov. 6, awarded Dec. 14. CD 11/8.

▲ **Bird Constr. Co., Ltd.** 201 Queen St., Portage La Prairie, Man., CA, **$1,146,472,** barrack blocks at camp, WINNIPEG, MAN. Govt. of Canada Dpt. National Defence, Cartier Sq., Ottawa, Ont. Defence Constr. 1951 Ltd., 70 Lyon St., Ottawa, Ont., engr.

▲ **Dell Construction Co., Ltd.,** 2453 A Bloor St. W., Toronto, Ont. Owner Builds, **$2,000,000,** seven 34-suite unit 2 story, bsmnt., brick, block APARTMENT, AJAX, ONT.

▲ **G. Daneau,** 5670 Cote des Neiges Rd., Montreal, Que., CA, **$3,000,000,** twenty 3 story, bsmnt., reinforced brick APARTMENT BLOCKS, ST. LAURENT (Postal Dist. Montreal), QUE. Owner, c/o Charles Grenier, archt., 170 Geneva Crescent, Mount Royal, Que. H. Jasen, 1410 Guy St., Montreal, Que., engr. CD 12/18.

PROPOSED PROJECTS

WATER SUPPLY

Mo., Richmond—City, voted **$250,000** bonds, water sys. imprvs., treatment plant, water softener, extens. and repairs to distr. lines, E. T. Archer Engineers Co., Railway Exchange Bldg., Kansas City, Mo., consult. engr. CD 11/21.

Wash., Tacoma—Lakewood Water Dist., 11900 Gravelly Lake Dr., voted bonds, 2 wells, 2 standpipes with combined capacity of 1 m.g. and water mains south of city. **$600,000.** Worthen & Wing, 11120 Gravelly Lake Dr., consult. engrs.

▲ **Alaska, Anchorage**—City, City Hall, water supply, treatment and reservoir sys. **$16,000,000.** CD 5/23.

SEWERS, WASTE DISPOSAL

Conn., Naugatuck—Boro, Charles D. Curtis, Town Hall, sewage disposal plant, **$500,000,** Malcolm Pirnie, 25 W. 43 St., New York, N. Y., consult. engr. CD 10/15/45.

Ill., Sycamore—City, sanitary sewers, **$200,000.** Walter E. Deuchler Co., 63 S. LaSalle St., Aurora, Ill., consult. engr.

Minn., Cass Lake—Village, Loretta Larson, clk., sewage treatment plant. **$250,000.** R. D. Thomas & Assoc., 400 Metropolitan Life Bldg., Minneapolis, consult. engrs. CD 5/1/47.

Minn., Delano—Village, G. Von Bank, clk., sewage treatment plant. **$300,000.** R. D. Thomas & Assoc., 400 Metropolitan Life Bldg., Minneapolis, consult. engrs. CD 10/24/45.

Minn., Madelia—Village, C. E. Seymour, clk., sewage treatment plant. **$260,000.** R. D. Thomas & Assoc., 400 Metropolitan Life Bldg., Minneapolis, consult. engrs. CD 9/26/45.

▲ **Tex., San Antonio**—City, City Hall, Military Plaza, sanitary sewer laterals or collection lines, **$1,000,000;** sanitary sewer mains, **$2,000,000;** sewage disposal plant, **$1,000,000.** Walter H. Lilly & Assoc., Transit Tower Bldg., consult. engrs. CD 12/18.

BRIDGES

Neb., Hebron—Thayer Co., defeated **$500,000** bonds, bridge construction. CD 11/13.

O., Columbus—City, Front St. Bridge **$600,000.** Robert F. Werner, city engr. CD 9/7/43.

▲ **SOUTH CAROLINA**—State Hy. Dpt., Columbia, **Georgetown and Horry Counties**—reconstruct Yauhannah Bridge over Great Pee Dee River, **$1,500,000.**

Marion and Florence Counties—reconstruct bridge over Pee Dee River on Rte. 378, est. **$200,000.**

Tex., Fort Worth—Tarrant County Water Control & Imprv. Dist. 1, c/o [illegible] B. Hogsett, pres., structural steel and reinforced concrete bridge over 600 ft. long, four-lane, over Trinity River on Cold Springs Rd. Approx. **$400,000.** Freese & Nichols, 407 Danciger Bldg., consult. engrs.

Tex., San [illegible] City Hall, Military Plaza, brid[illegible] Walter H. Lilly & Assoc., [illegible] CD 12/19.

[illegible] ted bonds, [illegible] $25,-

[illegible] Dpt. P. [illegible] mi. local [illegible] c/o owner, [illegible]

[illegible] 29.2 mi. roads, $174,850.
[illegible] 38.9 mi. roads, $397,850.
[illegible] 21.55 mi. roads, $211,050.

Toledo—City Hall, pave and widen Monroe St. [illegible] Summit to W. corporation, $290,900; repave and [illegible] Navarre Ave. from Woodville Rd. to Toledo [illegible] $184,050; Jackman St. one block; resurface School Ave. from W. Central to Monroe St. $60,000; [illegible] Martha to Jackman St., $182,[illegible] between Berry and Ash Sts. [illegible] CD 10/17/49.

▲ **Okla., Oklahoma City**—Oklahoma Co., Court House, voted [illegible] bonds, $6,527,000. Art Hazzard, [illegible] owner, engr. CD 11/5.

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▲ **SOUTH CAROLINA**—State Hy. Dpt., Columbia, Aiken Co.—grading, paving 13 mi. from city of Aiken to AEC area, $750,000.

Anderson Co.—by-pass on Hy. 29, $300,000.

▲ **Tex., San Antonio**—City, City Hall, Military Plaza, new permanent type street paving, $1,500,000; general rehabilitation and repaving, resurf. business and residential streets, $1,500,000. Walter H. Lilly & Assoc., Transit Tower, consult. engrs. CD 12/19.

EARTHWORK, WATERWAYS

▲ **Tex., Harlingen**—Rio Grande Auth., Harlingen, gravity canal irrigation project from Donna eastward to Brownsville area, Approx. $10,000,000. A. Tamm., Harlingen, consult. engr.

Tex., Kerrville—Kerr Co., Court House, new bond election soon, series low water dams for flood prevention, $350,000. Bond election Nov. 13 cancelled. CD 10/3.

▲ **Tex., San Antonio**—City, City Hall, Military Plaza, flood control (mostly river straightening, widening, deepening), $7,500,000; drainage, $10,000,000. Walter H. Lilly & Assoc., Transit Tower, consult. engrs. CD 12/18.

Wisconsin—Namekagon Hydro Co., Frederick, hydro-electric dam Namekagon River 16 mi. east of Minong, Washburn Co. $414,780. H. Hagestad, River Falls, consult, engr.

AIRPORTS

Neb., Lincoln—AIRPORT—City, City Hall, terminal at municipal airport. $500,000. D. L. Erickson, city engr. CD 5/16.

† **Tex., Ellington Field Air Force Base**—WAREHOUSES—U. S. Eng., 606 Santa Fe Bldg., Galveston, plans by Claude H. Lindsley, 5008 Almeda Rd., Houston, 2 warehouse, 40,000 sq. ft. and 10,000 sq. ft. wooden exterior, concrete slab fdn. $375,000. CD 9/19.

† **Wash., Tacoma**—WAREHOUSE—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, 200x200 ft. warehouse (ADC) with attached steam plant, McChord Air Force Base. $400,000. CD 7/27.

LATIN AMERICA

▲ **Guatemala, Guatemala City**—Glenn McCarthy Interests & Assoc., Shell Bldg., Houston, Tex., U. S. A., plans casino, $3,000,000; 17-mi. toll road leading into Guatemala City, $4,500,000; television station, $500,000.

Mexico, Mexico City—Juan Sordo Madaleno Insurgentes, 254, plans 14-story office. $600,000.

Mexico, Toluca—State Govt., (Sanchez Colin, gov.). Palacio del Estado, Toluca, Mexico, plans stadium. $500,000.

PUBLIC BUILDINGS

▲ **Calif., Oakland**—HOUSING—Housing Auth of Oakland, 935 Union St., plans by Ralph E. Wastell & Edward Cerruti, 1440 Broadway, Oakland, Calif., three 11 story, 336 unit, rein.-con. bldgs. Cal 3-6, $3,637,000. CD 8/23/50.

Calif., Richmond—SCHOOL—Richmond City Elementary & High School Dist., 1108 Bissell Ave., plans by Schmidts & Hardman, 1320 University Ave., Berkeley, Cortez Elementary School, $600,000. CD 2/19/48.

Calif., Salinas—HOUSING—Housing Auth. of Monterey Co., 24 Metz Way, Salinas, Calif., plans by Chas. E. Butner, 1112 Parajo Way, 100-unit housing, $600,000.

Calif., Santa Clara—SCHOOLS—Santa Clara Elementary School Dist., Santa Clara, $890,000 bond election Feb. 26, 2 elementary schools, ground imprvts., etc. CD 12/14.

Calif., Sunnyvale—SCHOOL—Sunnyvale Elementary School Dist., 465 Bayview St., plans by Donald Powers Smith, 583 Market St., San Francisco, South Fair Oaks Elementary School. $400,000.

Calif., Willows — SCHOOL — Willows Union Elementary School Dist., Willows, voted $470,000 bonds, school in northwest section. Kiblik & Fisher, 2203 13 St., Sacramento, archts. CD 10/19.

Colo., Englewood—SCHOOLS—School Dist. 1, Arapahoe County, Englewood, 3 elementary schools and wing addn. on new high school $950,000. Temple Buell, 730 14 St., Denver, consult. engrs. and archts. CD 6/13/50.

Colo., Fort Collins—SCHOOL—School Dist. 5, Fort Collins, bond election Jan. 22, high school addn. $600,000. Atchison & Kloverstrom, 1254 Monaco Parkway, Denver, consult. engr. and archt.

Conn., Colchester—SCHOOL—Town, Robert Littlehale, chn. Bldg. Comn., plans by Alfred Reinhardt, 130 Washington St., Hartford, Junior-Senior High School, $500,000.

▲ **Conn., New Britain**—HOUSING—City, Housing Auth., 16 Armistice St., moderate rental housing, $3,150,000.

Del., Wilmington—SCHOOL—Bd. Educ., 11 and Wollaston Sts., plans by Stanhope & Manning, 902 Orange St., School, Lord and Lombard Sts., etc., $670,000; plans by Victorine & Samuel Homsey, 917 Gilpin Ave., Dr. Charles R. Drew Elementary School, $700,000. CD 3/11/46.

▲ **Ga., Augusta**—HOSPITAL—Georgia State Bd. Health, State Office Bldg., Atlanta, plans by Gregson & Ellis, Mortgage Guarantee Bldg., Atlanta, State General Hospital, $13,999,000. CD 3/23.

▲ **Ill., Elmhurst**—SCHOOL—York Community High School, plans by Childs & Smith, 20 W. Wacker Dr., Chicago, Zone 6, high school addns. $2,500,000.

Ill., Pekin—SCHOOL—School Dist. 108, H. B. Green, supt. Schools, Pekin, Junior High School and one section elementary school $990,000. CD 3/22/45.

▲ **Ind., Bloomington**—LIBRARY—Bd. Trustees, Indiana University, Bloomington, plans by A. M. Strauss, Inc., Strauss Bldg., Fort Wayne, Ind., library for undergraduate students, $1,000,000. CD 6/2/47.

Ind., Evansville—SCHOOL IMPRVS.—Vandenberg Co. Bd. Educ., Evansville, plans by Ralph Legeman, 10 Chestnut St., imprvts., addns. to Emma Roach School. $500,000.

Ind., Kokomo—SCHOOL—School City of Kokomo, c/o High School, plans by Perkins & Will, 309 Jackson Blvd., Chicago 6, Ill., school, $650,000. Beine, Hall & Curran, 607 Broadway, Gary, assoc. archts. CD 7/1/46.

▲ **La., Opelousas**—SCHOOL—St. Landry Parish School Bd., voted $2,000,000 bonds, school imprvs. CD 11/13.

▲ **Mass., Boston**—GARAGE—City, Real Estate Comn., City Hall Annex, plans by Thomas Worcester, Inc., engr. and archt., 84 State St., garage-off street parking, St. James Ave., Berkeley, Clarendon and Providence Sts. $1,250,000. CD 11/27/50.

▲ **Mass., Brockton**—HOUSING—Brockton Housing Auth., 164 Richmond St., plans by Emery J. Laliberte, 226 Main St., Brockton, and Arthur R. Murphy, 231 Main St., Brockton, assoc. archt., 100 housing units. $1,000,000.

Mass., Greenfield—SCHOOL—Town, F. W. Porter, supt. schools, 125 Federal St., Junior High School, $400,000.

Mass., Holyoke—BOILER PLANT—City, Gas & Electric Dpt., 70 Suffolk St., brick boiler plant, $700,000. P. J. Kennedy & Co., 380 High St., consult. engrs.

▲† **Mass., Natick**—LABORATORY—U. S. Eng., 857 Commonwealth Ave., Boston, plans by R. I. Ballinger, 121 N. Broad St., Phila., Pa., quartermaster laboratory on Lake Cochituate, $10,000,000. CD 3/22/51.

▲ **Mass., Natick**—SCHOOL—Town, Supt. Schools, plans by Coolidge, Shepley, Bullfinch & Abbott, 1 Court St., Boston, and Smith & Sellew, 687 Boylston St., Boston, assoc. archts., Senior High School, Seymour Ave. $2,500,000. CD 8/31.

Mass., North Adams—SCHOOL—City, R. N. Taylor, supt. Schools, Ray E. Sutton, chn. Bldg. Comn., City Hall, Junior High School. $500,000. CD 1/27/50.

Mass., Northbridge—SCHOOL—Town, School Dpt., Hill St., plans by Leland & Larsen, 814 Statler Bldg., Boston, high school addn. $950,000.

▲ **Mass., Pittsfield**—HOUSING—Pittsfield Housing Auth., 52 School St., 200 housing units, $2,000,000.

▲ **Minn., Austin**—SCHOOLS—Bd. Educ., Marjorie Hamlin, clk., voted $2,945,000 bonds Dec. 10, 2 new grade schools, 2 school addns. Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, archts. CD 12/4.

Minn., Red Wing—GYMNASIUM—Bd. Educ., voted $600,000 bonds Dec. 4, enlarging 130x170 ft. gymnasium. Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, archts. CD 11/28.

▲ **Minn., Richfield (Minneapolis P. O.)**—SCHOOL—Bd. Educ., E. C. Ellenson, clk., plans by Thorshov & Cerny, 400 Metropolitan Life Bldg., Minneapolis, 2 grade schools, one at 65 St. and Thomas Ave. south and other at 70 St. and Elliot Ave. Est. $1,000,000. Purchase of sites approved at election Dec. 10. CD 11/28/49.

Minn., Warren—SCHOOL—Bd. Educ., A. A. Harris, clk., voted $525,000 bonds Dec. 12, high school, L. C. Pinault, St. Cloud, archt. CD 7/25.

▲ **Miss., Meridian**—PLANT—City, plans by Alfred Benberg, 4550 Main St., Kansas City, Mo., mfg. plant for W. S. Dickey Clay Mfg. Co. $1,650,000. CD 10/10.

▲ **Mo., Mexico**—HOSPITAL—Audrain Co., c/o County Court, Court House, voted $500,000 bonds, county hospital addn. $1,000,000.

Neb., Schuyler—HIGH SCHOOL—Bd. Educ., plans by John Latenser & Sons, 1307 Farnam St., Omaha, high school, $430,000. CD 5/16.

▲ **Neb., Grand Island**—SCHOOLS—Bd. Educ., Grand Island, Barr Junior High School addn., $400,000; Walnut Elementary School, $400,000; remodel Senior High School into a Junior High School, $350,000; construct Senior High School, $2,000,000.

▲† **N. H., Mt. Washington**—LABORATORY—U. S. Eng., 857 Commonwealth Ave., Boston, Mass., plans by Perry-Shaw-Hepburn-Kehoe & Dean, 31 St. James Ave., Boston, Mass., climatic research laboratory, research and development bldgs., admin. bldg., climatic bldg., engineering bldg. and boiler plant. $1,600,000.

N. J., **Florence**—HOUSING—Florence Housing Auth., plans by Henry W. Petty, Moorestown, N. J., 50 unit housing $500,000. CD 11/15/50.

N. Y., Brooklyn—SCHOOL—Bd. Educ., 110 Livingston St., plans by William Hufner, c/o owner, P. S. 157 alterations, 850 Kent Ave. $570,000.

▲ **N. C., Waynesville**—SCHOOLS—Haywood Co. Bd. Educ., Jule Noland, clk., Waynesville, voted bonds, county school. $2,000,000. CD 11/13.

Okla., Oklahoma City—HIGH SCHOOL—Oklahoma Co., Zone 2, voted bonds, negro high school. $900,000. Hudgins, Thompson & Ball, 1100½ Main St., archts. CD 11/7.

▲ **Pa., Folsom**—HIGH SCHOOL—Ridley Twp. School Dist., Folsom, plans by Joseph J. Wigmore, 117 S. 17 St., Phila., Junior High School, $1,055,000; elementary school, $350,000. CD 10/15/45.

▲ **Pa., Phila.** — PSYCHIATRIC INSTITUTE — General State Auth., 18 and Herr Sts., Harrisburg, plans by Harbeson, Hough, Livingston & Larson and Harry Sternfeld, 1413 Walnut St., Eastern Penna. Psychiatric Institute. $,000,000. Sanders & Thomas, Inc., and Wm. H. Gravell, 1411 Walnut St., Phila., engrs. CD 5/26/50.

▲ **Pa., Phila.**—HOUSING—Phila. Housing Auth., 42 S. 15 St., plans by Walter Antrim & Charles G. Etter, 117 S. 17 St., superstructure low rent housing development, Norris Homes. $2,923,492. Gibson & Kline, 117 S. 17 St., consult. engrs. CD 12/14/50.

▲ **Tex., Austin**—HOSPITAL—Bd. for Texas State Hospitals & Special Schools, 45 and Lamar Sts., plans by Walter C. Moore, superv. archt., 45 and Lamar Sts., Jessen, Jessen, Millhouse & Greeven, 2616 N. Guadalupe St., 200-bed medical and surgical hospital and laboratory for Austin State Hospital, $1,200,000. CD 9/17.

▲ **Tex., Edinburg**—COURT HOUSE—Hidalgo Co., Edinburg, plans by R. Newell Waters, Edinburg, 70,000 sq. ft. courthouse. $1,500,000. Francis J. Niven, 3908 Main St., Houston, consult. engr. CD 8/23.

▲ **Tex., Rockdale**—SCHOOLS—Rockdale School Bd., c/o W. C. Grisson, supt., Rockdale, high school unit, $375,000; Intermediate School, $350,000; elementary school, $300,000.

▲ **Tex., San Antonio**—CITY HALL, etc.—City, City Hall, Military Plaza, city hall and jail. $1,500,000. Walter H. Lilly & Assoc., Transit Tower, consult. engr. CD 12/19.

Vt., Waterbury—DORMITORY—State, State Bldg. Council, State Office Bldg., Montpelier, plans by Webber & Erickson, 56½ Merchants Row, Rutland, 3 story bsmnt., brick veneer, concrete or cinder block female dormitory, central unit 41x47 ft., wing 39x100 ft., end wing 39x85 ft. at State Hospital. $575,000.

B. C., Prince Rupert—HOUSING—J. L. Adams, engr., c/o Central Mortgage & Housing Corp., 360 Homer St., Vancouver, B. C., 50 housing units, $530,000.

▲ **B. C., Trail**—HOUSING—J. L. Adams, engr., Central Mortgage & Housing Corp., 360 Homer St., Vancouver, B. C., 277 housing units, Approx. $2,800,000.

COMMERCIAL BUILDINGS

Calif., Oakland—HOUSING—Twelfth Naval Dist., Federal Office Bldg., San Francisco, Zone 2, plans by H. C. Baumann, 251 Kearny St., San Francisco, construct, manage and finance, 55 unit housing, Naval Hospital Oakland Naval Base, $500,000.

Fla., Jacksonville—HOSPITAL—St. Vincent Hospital Assn., Barrs St., 126-bed St. Vincent Hospital addn., on St. Johns River in Riverside Section, $402,500. Reynolds, Smith & Hills, 227 Park St., consult. engrs. and archts.

▲ **Ga., Augusta**—RESIDENCES—Zachary Developing Co., Co., c/o Kuhlke & Wade, archts., 16 Campbell Bldg., 450 residences, $6,500,000.

Ill., Chicago—RESTAURANT—Toffenetti Restaurants, 225 S. Wabash St., Chicago, Zone 3, plans by Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago 3, Ill., restaurant in Greyhound Bus Terminal, at Clark and Randolph Sts., $500,000.

Ind., Indianapolis—ACADEMIC HALL—Indiana Central College, 4001 S. Otterbein St., plans by D. A. Bohlen & Sons Co., State Life Bldg., Zone 5, 3 story, brick, steel academic hall. $975,000.

O., Toledo—NURSING TRAINING CENTER—Bd. Trustees, Flower Hospital, Cherry St., plans by Bellman, Gillett & Richards, 518 Jefferson St., 4 story nursing training center, Collingwood Blvd. near Cherry St. $700,000.

▲ **Pa., Elkins Park**—APARTMENT—Garland Constr. Co., 6730 York Rd., Phila., apartment development, High School Rd. $1,000,000.

Pa., Phila.—HOME—Baptist Home of Phila., Roosevelt Blvd. and Pennypack Circle, plans by Horace W. Castor, 117 S. 17 St., home addn. $600,000. Sauter & Castor, 1411 Walnut St., consult. engrs. CD 4/17/51.

▲ **S. D., Rapid City**—HOUSING—U. S. Govt., E. H. Ellsworth, Wing Commander, Rapid City, plans by Western Architects, Inc., Rapid City, consisting of U. L. Freed, archt., 117½ S. Main St., Aberdeen, S. D. and F. J. Sheridan, engr., 11 Lacotah Bldg., Sioux Falls, construct, manage finance, housing, adjacent to Rapid City Air Force Base. est. $6,000,000.

Tenn., Memphis—OFFICE, etc.—Euclid Memphis Sales Co., 185 E. Butler St., 20,000 sq. ft. steel, concrete office and warehouse. $400,000.

Tex., San Antonio—SHOPPING CENTER—G. S. McCreless, 1102 Fair Ave., plans by Shoop & Roberts, 122 W. Olmos Dr., South Side Shopping Center to contain 8 structures totalling 75,000 sq. ft., brick exterior, concrete frame, concrete pier and beam fdn. $500,000. R. Marvin Shipman, 146 W. Olmos Dr., consult. engr.

Tex., San Marcos—DINING HALL, etc.—San Marcos Academy, San Marcos, plans by Wyatt C. Hedrick, 5201 Fannin St., Houston, Talbott Hall and dining hall expans. $300,000; 150 capacity dormitory for girls and faculty personnel, $300,000. CD 12/12.

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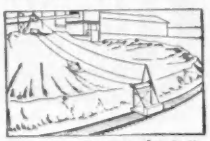

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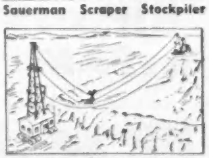

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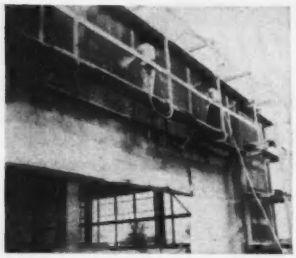

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Ont., Ancaster—SCHOOL—Sisters Servants of Mary Immaculate c/o J. H. Haffa, archt., 294 Ontario St., Toronto, 2 story, bsmnt., U-shaped, stone, brick structural steel, rein.-con. school, Approx. $500,000. CD 11/6/46.

Ont., Toronto—CHURCH TRAINING SCHOOL—United Church of Canada, 299 Queen St. W., plans by Arthur H. Eadie, 22 Bloor St. W., church training school near Victoria College, University of Toronto. $600,000. CD 1/21/47.

INDUSTRIAL BUILDINGS

▲ Calif., Palo Alto—PLANT—Verian Assocs., c/o Eric Mendelsohn & Michael A. Gallis, archts., 627 Commercial St., San Francisco, electronic plant, $1,000,000. Isadore Thompson, 583 Market St., San Francisco, structural engr.

▲ Ia., Mason City—PLANT—North Iowa Co-operative Procession Assn., Mason City, soybean procession plant, $1,400,000.

Minn., Minneapolis — PLANT — Augsburg Publishing House, 425 S. 4 St., plans by Lang & Raugland, 802 Wesley Temple Bldg., publishing plant, 5 St. and 5 Ave. South. $300,000.

Minn., New Brighton—WAREHOUSE and OFFICE—Marshall-Wells Co., New Brighton, plans by L. B. Abbett, 1107 Wesley Temple Bldg., Minneapolis, warehouse and office, Prior and Cottonwood Aves., $500,000.

▲ N. C., Spray—PLANT—Union Carbide & Carbon Co., 30 E. 42 St., New York, N. Y., plant, $33,000,000.

▲ Okla., Blackwell—PLANT—Cities Service Oil Co., 70 Pine St., New York, N. Y., combination butane-propane plant. $3,880,000.

▲ Tex., Corpus Christi—PLANT—Great Southern Chemical Co., Robstown Rd., benzine and tolune plant. $4,000,000.

▲ Tex., Corpus Christi—PLANTS—American Smelting & Refining Co., Shell Rd., electrolytic zinc production unit, $5,854,000; zinc smelting and refining plant unit, $745,000; construct sulphuric acid unit, $610,375.

▲ Tex., Sunray — PLANT — Phillips Petroleum Co., Bartlesville, Okla., natural gasoline plant. $1,007,225.

▲ Tex., Sunray—REFINERY—Shamrock Oil & Gas Corp., Sunray, refinery for production of 1,000 bbl. daily for reduced crude (continuous-cooking contact method) $2,225,000. Lummus Co., M. Esperson Bldg., Houston, consult. engr.

▲ Tex., Texas City—REFINERY—Pan-American Refining Corp., Texas City, gasoline refinery, $18,674,500.

▲ Ont., St. Catherines—PLANT EXPANSION—Thompson Products Ltd., 37 South St., plans by T. R. Wiley, 32 William St., 235x540 ft., structural steel, brick concrete plant expansion. $4,000,000. CD 12/12.

▲ Que., Valcourt—PLANT—Auto Neige Bombardier Ltd., Valcourt, plant exten. $1,000,000.

UNCLASSIFIED

Ga., Atlanta—RADIO CENTER—National Council of Church, c/o Dr. John M. Alexander, Henry Grady Bldg., radio center. $500,000.

La., New Orleans—MOTOR COURT—Airline Highway Tourist Court, c/o Patrick M. Allison & Assoc., archts., 315 St. Charles St., motor court, $300,000.

▲ Nebraska—RURAL DISTRIBUTION LINES—Loup Valley Rural Electric Membership Assn., Ord, 372 mi. rural distr. lines, Sherman, Valley, Greeley, Wheeler and Garfield Counties. $4,450,000. Raymond H. Reed & Co., Columbus, consult. engrs.

Nebraska—RURAL DISTRIBUTION LINES—Southwest Electric Membership Assn., Palisade, construct 285 mi. rural distr. lines, Chase, Dundy, Hayes, Hitchcock, and Frontier Counties. $350,000. Flora Eng. Co., 1717 E. Colfax Ave., Denver, Colo., consult. engr.

New Mexico—GAS LINES—El Paso Natural Gas Co., Bassett Tower, El Paso, Tex., natural gas lines, Farmington area connecting various wells in the field. $100,000.

New Mexico—COMPRESSOR STATION and GAS LINE—Southern Union Gas Co., Clovis, 300 hp. compressor station, near Clovis, $300,000; 19 mi. gas pipe line, Clovis Area, $75,000. CD 5/10.

Texas—RURAL DISTRIBUTION LINES—Bailey Co. Electric Co-operative Assn., Muleshoe, rural distr. lines and sys. improvs., Bailey Co. $487,000. CD 9/18/46.

Tex., San Antonio—ELECTRIC SYSTEM—City, City Hall, Military Plaza, electric signal sys., improvs. and extens. incl. underground cables, $500,000. Walter H. Lilly & Assoc., Transit Tower., consult. engrs. CD 12/18.

▲ Tex., San Antonio—PARKS, etc.—City, City Hall, Military Plaza, parks, $750,000; playgrounds, athletic and recreation courts, $250,000. Walter H. Lilly & Assoc., Transit Tower, consult. engrs. CD 12/18.

▲† Washington — POWER CABLE — Bonneville Power Admin., P.O. Box 3537, Portland, Ore., 230,000 volt submarine power cable across Puget Sound from Snohomish Sub-station to Kitsap Peninsula distance of 5½ miles. CD 2/5.

Que., Gaspe—BROADCASTING STATION—Canadian Broadcasting Comn., 1231 St. Catherine St. W., Montreal, broadcasting station and short wave station to provide C.B.C. coverage for Northern Quebec $550,000.

CONSTRUCTION REPORTS-Second Section

NEW ENGLAND

BIDS ASKED—BUILDINGS

▲ **Mass., Malden**—HOUSING—B.A. 1/18—Malden Housing Auth., Aldermanic Chambers, City Hall, 250 housing units, PHA 22-1. $2,500,000. Arland A. Dirlam, 673 Boylston St., Boston, archt. CD 7/9, under LB.

▲ **Mass., Lynn**—SCHOOL—B.A. 1/29—City School Dpt., 42 Franklin St., elementary school addn. and west wing addn. to existing Junior-High School and Pickering Junior High School alterations, Conomo Ave. Approx. $1,000,000. Plans deposit $75. M. A. Dyer Co., 24 School St., Boston, archt. CD 12/28/50.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Boston Housing Auth.,** 230 Congress St., Boston, Mass. cancelled bids to have been opened Jan. 9, 259 HOUSING units, Wood Estate (Galvin Block Development), Dorchester, BOSTON, MASS. $2,850,000. Will re-advertise. CD 12/14.

Park Constr. Co., Inc., 40 Court St., Boston, Mass., LB $585,881, INFIRMARY BLDG., Massachusetts Hospital School, C-202, Contr. 1, CANTON, MASS. Commonwealth of Mass., Dpt. P. Welfare, 600 Washington St., Boston, Mass. CD 1/17, under LB.

Walsh Bros., 150 Hampshire St., Cambridge, Mass., CA. Appro. $850,000. DORMITORY and CLASSROOM BLDG., MILTON, MASS. St. Columbans Foreign Mission Society, Very Rev. Joseph McGlade, 1372 Brush Hill Rd., Milton, Mass. Bids Dec. 12. CD 12/4.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
January 8 Maryland

BIDS ASKED—BUILDINGS

▲ **N. Y., Troy**—HOUSING—B.A. 1/8—Troy Municipal Housing Auth. City Hall Bldg., 278 family housing, Project NY12-2 on River St. $3,500,000; 144 family housing Project NY 12-3, on Ferry St. $1,800,000. CD 9/28/48.

Md. Annapolis—HOUSING—B.A. 1/9—Annapolis Housing Auth., 89 College Ave., 2 story, slag block 85 housing units, $700,000. Plans deposit $100. Rogers & Taliaferro, 49 College Ave., archts. Frederick Runyon & Henry Redue, Annapolis, engrs. CD 7/10/50.

N. Y., Brooklyn—HOUSING—B.A. 1/15—New York City Housing Auth., 63 Park Row, New York, Zone 7, foundations and general constr.; heating and ventilating; electrical work; plumbing for Van Dyke Houses, Proj. No. NF-5-13, Sect. I, incl. Bldgs. 1 to 13 (inclusive) in area bounded by Sutter Ave., Powel St., Blake Ave., Stone Ave. and by Blake Ave., Christoper St., Dumont Ave. and Stone Ave. Plans deposit $75, elevators $25. CD 3/23.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

NEW YORK—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,

Garafano Constr. Co., 17 E. Prospect Ave., Mt. Vernon, N. Y., LB $265,952. construct 85 ft. span grade separation structure to eliminate the Taconic State Parkway grade crossing at Underhill Rd., Westchester Co. Bids Dec. 19. CD 11/29.

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,

Seneca Equipment Co., Rochester, N. Y. LB $767,312, construct 1.82 mi. William St.-Harlem Ave. segment of the Ontario Sect. of the New York State Thruway, Erie Co.;

D. W. Winkelman Co., Inc., Heffernan Bldg., Syracuse, N. Y., LB $1,100,698, construction work to modernize U.S. Rte. 219 between Ellicottville and Springville, Cattaraugus Co. Bids Dec. 19. CD 11/29.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,

Ralph Myers Contracting Corp., Salem, Ind., LB $2,499,954. construct 35,351 ft. rein.-con. pavement with crushed aggregate base with bit. surf., three structures, T. R. 21 relocated, Fayette Co.;

D. A. Kessler Constr. Co., Inc., 124 E. Ave., Mt. Carmel, Pa. LB $61,568. build-up and wid'n. 4,376 ft. pavement with crushed aggregate base and bit. surf. T. R. 242, Northumberland Co.;

Hempt Brothers, R. D. 1, Camp Hill, Pa., LB $481,880, wid'n. 9,348 ft. roadway with plain c. conc. base and bit. surf. new and existing pavement T. R. 11, 641, Cumberland Co.;

New Castle Duntile Co., 1409 Moravia St., New Castle, Pa., LB $162,180. construct 1,362 ft. crushed aggregate base with bit. surf. 18 ft. wide and 2 bridges, T. R. 198, Crawford Co.;

Conduit & Foundation Corp., 770 S. Schuylkill Ave., Phila., Pa., LB $4,174,791. c. conc. 8,536 ft. divided highway, one plate girder and one I-beam bridge, final sect. of Schuylkill Expressway, Montgomery Co. Bids Dec. 20. CD 12/4.

† **Blumenthal-Kahn Electric Co.,** 43 S. Liberty St., Baltimore, Md. LB $192,300, incl. Alt. 2A. grading, electric transmission line, Annapolis Experiment Switching and Metering Station for submarine test, ANNAPOLIS, MD. Pub. Wks. Office, U. S. Naval Academy, Annapolis, Md. Bids Dec. 11. CD 11/28.

Victor A. Pyles, 527 Chesapeake Ave., Baltimore, Md. LB $129,165. roads, grading, drainage at Crownsville State Hospital, CROWNSVILLE, MD. State, Dpt. P. Imprvts., 506 Park Ave., Baltimore 1, Md. Turpin, Wachter & Assoc., 1004 N. Charles St., Baltimore 1, Md., engrs. CD 10/17, under Public Bldgs.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Psaty & Furhman, Inc.,** 515 7th Ave., New York, N. Y. CA. $1,141,000. SCHOOL, P. S. 199, 48 Ave. and 40 St., Queens Boro, NEW YORK. Supt. School Bldgs., Design & Construction, 49 Flatbush Ave. exten. Brooklyn 1, N. Y. Bids Nov. 29. CD 12/3, under LB.

▲ **Psaty & Furhman,** 369 Lexington Ave., New York 17, N. Y., CA. $2,023,000. Junior HIGH SCHOOL 74, vicinity 210 St. and Horace Harding Blvd., Queens Boro, BAYSIDE, N. Y. Supt. School Bldgs., Design & Construction, 49 Flatbush Ave. exten., Brooklyn 1, N. Y. Bids Dec. 10. CD 11/29.

▲ **Harry Jereski, Inc.,** 420 Lexington Ave., New York 17, N. Y., CA, $1,045,900, SCHOOL, P. S. 27 addn., Nelson and Hicks Sts., BROOKLYN, N. Y. Supt. School Bldgs., Design and Constr., 49 Flatbush Ave. exten., Brooklyn 1, N. Y. Bids Nov. 14. CD 11/23, under LB.

▲ **Caristo Constr. Co.,** 26 Court St., Brooklyn 2, N. Y. CA. $1,517,000. SCHOOL, P. S. 287, Concord St., Navy St. and Hudson Ave., Brooklyn Boro, BROOKLYN, N. Y. Supt. School Bldgs., Design & Constr., 49 Flatbush Ave. exten., Brooklyn 1, N. Y. Bids Nov. 27. CD 10/29.

Laurence J. Rice, 30 Deepdane Rd., Forest Hills, N. Y. CA. $815,000. P. S. 277, SCHOOL, BROOKLYN, N. Y. Supt. School Bldgs., Design & Constr., 49 Flatbush Ave. exten., Brooklyn 1, N. Y. Bids Nov. 19. CD 10/29.

▲ **Joseph Weinstein, Inc., 66 Court St.,** Brooklyn 2, N. Y. CA $1,287,000. SCHOOL, P. S. 268, E. 53 St. and Clarkson Ave., BROOKLYN, N. Y. Supt. School Bldgs., Design & Construction, 49 Flatbush Ave. exten., Brooklyn 1, N. Y. CD 12/11, under LB.

▲ **T.G.K. Constr. Co., Inc.,** 55 W. 42 St., New York 18, N. Y. CA $1,086,500 SCHOOL, P. S. 215 Briar Pl., Brookhaven Ave., extending to Grassmere Terrace, FAR ROCKAWAY, N. Y. Supt. School Bldgs., Design & Construction, 49 Flatbush Ave. exten., Brooklyn 1, N. Y. CD 12/11, under LB.

▲ **Caristo Constr. Corp.,** 26 Court St., Brooklyn 2, N. Y. CA $2,051,000. Junior HIGH SCHOOL 168, vicinity 155 St. and 72 Ave., Queens Boro, FLUSH-

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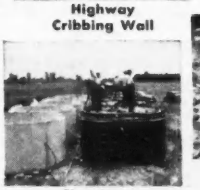

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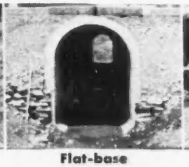

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ING, N. Y. Supt. School Bldgs., Design & Construction, 49 Flatbush Ave. extension, Brooklyn 1, N. Y. CD 12/11, under LB.

▲ Colmar Constr. Co., 364 Gold St., Brooklyn 1, N. Y. CA $1,154,000. SCHOOL, P. S. 196, 72 Rd. and Grand Central Parkway, FOREST HILLS, N. Y. Supt. School Bldgs., Design & Construction, 49 Flatbush Ave. extension, Brooklyn 1, N. Y. CD 12/11, under LB.

Planet Constr. Co., 11 W. 42 St., New York 18, N. Y. CA $587,000. SCHOOL, P. S. 8 addn., Lindenwood Ave. and Park Terrace, GREAT KILLS, N. Y. Supt. School Bldgs., Design & Construction, 49 Flatbush Ave. extension, Brooklyn 1, N. Y. CD 12/11, under LB.

▲ George F. Driscoll Co. & Mosher Constr. Corp., 40 E. 40 St., New York 17, N. Y. CA $2,628,262. JUNIOR HIGH SCHOOL 72, Avenue B, E. 4 and E. 5 Sts., Manhattan Boro, NEW YORK, N. Y. Supt. School Bldgs., Design & Construction, 49 Flatbush Ave. extension, Brooklyn 1, N. Y. CD 12/11, under LB.

▲ Colmar Constr. Co., 364 Gold St., Brooklyn 1, N. Y. CA $1,115,364. SCHOOL, P. S. 24, Independence Ave. between W. 235 and W. 236 Sts., extending westerly approx. 233 ft. from intersection of Independence Ave. and W. 235 St., NEW YORK, N. Y. Supt. School Bldgs., Design & Construction, 49 Flatbush Ave. extension, Brooklyn 1, N. Y. CD 12/11, under LB.

Nawrens Constr. Corp., 2124 Broad St., Pittsburgh, Pa., LB. Approx. $722,968, 4 three story bldgs., Federal HOUSING Proj. 610, BRADDOCK, PA. Allegheny Co. Housing Auth., City-County Bldg., Pittsburgh, Pa., Bids Dec. 18. CD 11/29.

C. C. Davis Constr. Co., Rear 220 Bridge St., New Cumberland, Pa., LB $648,300, construct Fourth SCHOOL, 13 and Sycamore Sts., HARRISBURG, PA. Harrisburg School Bd., 121 Chestnut St., Harrisburg, Pa. Bids Dec. 20. William L. Murray, Lehig N. 2 St., Harrisburg, Pa., archts. CD 11/14/50.

▲ Mark & Co., 1923 Samson St., Phila., Pa., LB $1,887,000, general constr.

Harry E. Nau & Co., Rear 1517-1319 St. N. W., Wash., D. C. LB $426,000, heating for HOSPITAL Bldg., for Mercy-Douglass Hospital, 50 and Woodlawn Sts., PHILA., PA. General States Auth., 18 and Herr Sts., Harrisburg, Pa., Bids Dec. 19. CD 12/13.

The Trimble Co., 1700 Penna. Ave., N. W., Pittsburgh, Pa., CA. Approx. $500,000, PACKING PLANT alterations, addns., PITTSBURGH, PA. Pennsylvania R. R., D. L. Sommerville, jr. engr. (Central Region) Pennsylvania Station, Pittsburgh 22, Pa. Hunting, Larsen & Dunnells, Century Bldg., Pittsburgh, Pa., archts.

Consolidated Engineering Co., 20 E. Franklin St., Baltimore, Md. CA foundations for Sintering PLANT, SPARROWS POINT (P.O. BALTIMORE), MD. Bethlehem Steel Co., 751 E. 63 St., Bethlehem, Pa. CD 12/26.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

Va., Powhatan—B.A. 1/7—State Penitentiary Farm, Powhatan, sanitary and storm sewers.

▲† Tennessee—B.A. 1/15—U. S. Eng., 303 U. S. Court House, Nashville, construct 1,006 ft. Cheatham Dam, 80 ft. wide on Cumberland River, near Ashland City, CIVENG 40-058-52-19. Est. $3,000,000.

† Fla., Orlando—ACADEMIC BLDG., etc.—B.A. 1/15—U. S. Eng., 575 Riverside Ave., Jacksonville, academic bldg., maintenance and supply group headquarters, AID administration, paint and dope storage and physiological trainer bldg., Pinecastle Air Force Base, Eng. 09-143-52-95 B. CD 12/14.

† Fla., Cocoa — DORMITORIES — B.A. About 1/24 — U. S. Eng., P. O. Box 4970, Jacksonville, airmen's dormitories Air Force Missile Test Center, Patrick Air Force Base, Serial No. Eng -08-123-52-9. CD 4/4.

BIDS ASKED—BUILDINGS

▲ Miss., Meridian—PLANT—B.A. 1/12—City, City Hall, mfg. plant for Textron, Inc. Approx. $3,000,000. Bill Archer, WMOX Bldg., Morris McNair, Rosenbaum Bldg., L. L. Brasfield, Kidder Bldg. and Krouse & Yarbrough, WMOX Bldg., all of Meridian, archts. CD 10/25.

▲ Tenn., Knoxville—STUDENT—FACULTY CENTER—B.A. About 1/15—University of Tennessee, Administration Bldg., student-faculty center. $1,300,000. Barber & McMurry, 2505 Kingston Pike, N. W., archts. CD 6/26/47.

Miss., Columbus — SCHOOL — B.A. 1/15 — Columbus Municipal Separate School Dist., White High School. $650,000. R. W. Naef, Masonic Temple Bldg., Jackson, archt. CD 8/15.

▲ Miss., Jackson—HOSPITAL—B.A. 1/17—St. Dominic's Hospital, c/o James T. Canizaro, archt., Deposit Guaranty Bank, hospital, $2,180,000. CD 12/13.

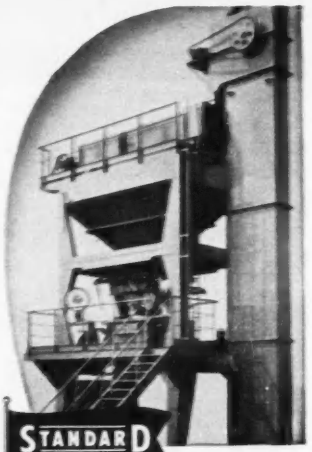
† S. C., Fort Jackson—CLASSROOMS, etc.—B.A. 1/15—U. S. Eng. 33 Customhouse, Charleston, classroom bldgs., etc., Inv. 52-19.

Va., Cleveland—SCHOOL—B.A. 1/21—Russell Co. Bd. Educ., Cleveland, school. R. V. Arnold, Bristol, archt.

▲ Tenn., Chattanooga—HIGH SCHOOL—B.A. 2/13—Bd. Educ., City Hall, Howard High School. $1,908,000. Extended date. CD 12/21.

SOON LETS CONTRACT—BUILDINGS

S. C., Charleston — CLASSROOM — DORMITORY — St. Catherines School, c/o J. Binford Walford & O. Pendleton Wright, archts., 103 E. Cary St., Richmond, Va., soon lets contract, classroom-dormitory bldg.



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HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NORTH CAROLINA**—State Hy. & P. Wks. Comn., Raleigh.

Nello L. Teer Co., Box 1131, Durham, N. C., LB **$406,982**, est. $400,000-$500,000, traffic bound macad., and asph. base and b. conc. binder and sand asph. surf. 17.3 mi. U. S. 64, from U. S. 17 in Williamston, east to beginning of bridge over Welch Creek, Proj. No. 1563, Martin Co.;

Ballenger Paving Co., Box 1046, Greenville, S. C., LB **$322,176**, est. $300,000-$400,000. STBC and b. conc. binder and surf. 7.76 mi. from junction of N. C. 87 approx. 5 mi. west of Acme, northeast to the junction of N. C. 53, approx. 0.1 mi. south of bridge over Black River at Pender-Bladen Co. line, Proj. 3-214, Columbus and Bladen Counties; LB **$108,481**, est. $75,000-$100,000, and sand asph. or b. conc. surf. 7.02 mi. from Lane Ferry Bridge, 2.3 mi. east of Rocky Point, east and southeast to Castle Hayne-Hampstead Rd., Proj. No. 3-402, S-194 (3), Pender Co.;

Kiker & Yount, Inc., Reidsville, N. C., LB **$408,148**, est. $400,000-$500,000, grading, 13.42 mi. relocation of U. S. 70 from junction of U. S. 70 near Efland, west to junction of N. C. 54 southeast of Graham, Proj. 5006, Orange and Durham Counties;

A. R. Thompson Contractor, Inc., Rutherfordton, N. C., LB **$117,193**, est. $125,000-$150,000. STBC, traffic bound macad. bit. surf. tr. b. conc. surf. 7.65 mi. from point on paved county road, approx. 3 mi. northeast of Sunshine, southeast to beginning of pavement at Housers Store approx. 0.5 mi. north of Hollis, from point on N. C. 26 approx. 2.6 mi. northeast of Golden Valley, northeast crossing Rutherford-Cleveland Co. line to beginning of pavement at Moriah School, Proj. 9-9-86-218, 9-9-80-2224, Cleveland and Rutherford Counties. Bids Dec. 18. CD 12/7.

BUILDINGS

LOW BIDS AND CONTRACTS

E. Carlton Wilton, Inc., c/o Ralph H. Dudley, Inc., 405 Travelers Bldg., Richmond, Va., Owner Builds. Approx. **$850,000**. 90 RESIDENCES in Beverly Hills, RICHMOND, VA.

Strother-Barge Co., 189 Cain St. N. E., Atlanta, Ga., LB, **$743,743**, 110 HOUSING units, CARTERSVILLE, GA. Cartersville Housing Auth., Cartersville, Ga. Bids Dec. 18.

Strother-Barge Co., 189 Cain St. N. E., Atlanta, Ga., LB **$664,664**, 110 HOUSING units, NEWNAN, GA. Newnan Housing Auth., Newnan, GA. Bids Dec. 18. CD 11/21.

Deicks Lumber Co., Elizabethtown, Ky., Owner Builds. CA, **$616,250**, 185 HOMES, ELIZABETHTOWN, KY. CD 3/17/50.

▲ † **J. W. Bateson Co. Inc.**, Irwin-Keasler Bldg., Dallas, Tex., LB **$22,840,018**. 42 BARRACKS, 4 B.O.Q.; 11 BN. 14Q, 3 Reg. HQ; 11 MOTOR REPAIR SHOPS, CARPENTER PAINT SHOP, UTILITY SHOP, 3 WAREHOUSES, COMM. BLDG., SUB STATION AND GUARD HOUSE, Eng 15-029-52-7, FORT CAMPBELL, KY. U. S. Eng., 830 W. Broadway, Louisville, Ky. Bids Dec. 19. CD 11/8.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Illinois**—B.A. 1/10—U. S. Eng., 34 U. S. Court House & Custom House, 1114 Market St., St. Louis 1, Mo., constructing about 1,150 lin. ft. levee incl. 18-in. topsoil blanket mulching, fertilizing and seeding the levee embankment near Grand Tower, Grand Tower Drainage and Levee District Proj. Item 1 D, Parts 1 and 2, CIVENG 23-065-52-44. CD 7/23/45.

▲ **Ill., Chicago**—B.A. 1/11—City, City Hall, substructure only for double leaf bascule trunnion bridge 4-lane, over Chicago River (North Branch) on Halsted St. $2,500,000. CD 3/19/45.

BIDS ASKED—BUILDINGS

▲ **Ill., Skokie**—FACTORY—B.A. 1/14—Ohmite Mfg. Co., 4835 W Flournoy St., Chicago, 130,000 sq. ft. factory, Howard and Central Park Ave., $1,200,000. Friedman, Alschuler & Sincere, 223 Jackson Blvd., Chicago, Zone 6, archts. CD 10/10.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

WISCONSIN—State Hy. Dpt., Madison,

Robert W. Ryan Co., Janesville, Wis. LB **$124,778**, Contr. 1, base course 3.674 mi. C. T. Hy. C, S.T.H. 81, Monticello Rd., Proj. 5 0369 (5), Green Co.;

Eric Jolander Constr. Co., Libertyville, Ill. LB **$61,097**. Contr. 1, b. conc. 0.202 mi. U. S. Hy. 41, State Line, Milwaukee Rd., motor vehicle fuel inspection, truck weighing station, Proj. T 02-1 (12), Kenosha Co.;

Alexander Constr. Co., 508 Hoeschler Bldg., LaCrosse, Wis. LB **$116,431**. Contrs. 2 and 3, single aggregate bit. surf. 6.247 mi., S. T. Hy. 121 and 95, Independence-Whitehall and South Street-Taylor Rd., Proj. 5 0180 (4), T 053 (2), Trempealeau Co. Bids Dec. 18. CD 11/28.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **General Electric Co.**, River Rd., Schenectady, N. Y., CA, **$1,088,760**, 30,000 kw. turbo-generator for municipal POWER PLANT, RICHMOND, IND. Bd. P. Wks., City Hall, Richmond, Ind. Bids Oct. 29, awarded Dec. 17. CD 10/15.

Harry H. Verkler, 645 N. Wilbur St., South Bend, Ind., OA. **$800,000**. general constr. Pierre Navarre SCHOOL,

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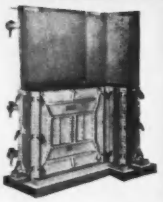

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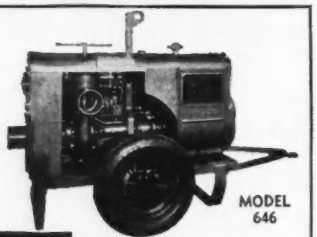

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SOUTH BEND, IND. South Bend, School Bd., 228 St. Joseph St., South Bend, Ind. Bids Oct. 22, awarded Dec. 10. CD 11/29.

▲ **Herlihy-Midcontinent Co.**, 135 S. La Salle St., Chicago, 3, Ill., LB, **$1,440,000**, 150 unit APARTMENT, 4 Lake Park and Oakwood Aves., CHICAGO, ILL. Chicago Housing Auth., 608 S. Dearborn St., Chicago, 5, Ill. Bids Dec. 13. CD 11/27.

Chas. B. Johnson & Son Co., 6 N. Michigan Ave., Chicago, 2, Ill., CA, **$600,000**, POWER PLANT addn., CHICAGO, ILL. Campbell Soup Co., 2550 W. 35 St., Chicago, Ill. Bids Oct. 26, awarded Dec. 18. CD 10/24.

Geo. Sollitt Constr. Co., 109 N. Dearborn St., Chicago, 21, Ill., LB, **$844,000**, 8 story, 45x125 ft. NURSES APARTMENT, at Flournoy and Hermitage Sts. in Medical Center, CHICAGO, ILL. Presbyterian Hospital, 2753 and Wolf Rds., DES PLAINES, ILL. CD 3/28.

▲ **Herzog & Kuntze**, 1032 Lee St., Des Plaines, Ill. Own Forces, **$1,700,000**, 170 HOMES, on Algonquin and Wolf Rds., DES PLAINES, ILL. CD 3/28.

Nels Quist, Gages Lake Rd., Grays Lake, Ill., **CA $440,000**, SCHOOL, GURNEE, ILL. School Dist. 50, Gurnee, Ill. Bids Nov. 27, awarded Dec. 21. (Correction—Contractor). CD 12/20, under CA.

S. M. Wilson & Co., 1903 State St., Granite City, Ill., LB, **$869,355**, Proj. Ill. 15-3 consisting 13 two story bldgs., incl. 84 dwelling units and 1 story management and maintenance bldg., MADISON, ILL. Madison County Housing Auth., D. F. Braner, exec. Dir., 3 and Haller Sts., East Alton, Ill. Bids Dec. 18. CD 11/26.

▲ **Ragner Benson, Inc.**, 4744 W. Rice St., Chicago, 4, Ill., CA, **$2,500,000**, 170,000 sq. ft. FACTORY addn., railroad track addn., McCOOK, ILL. Electromotive Div. of General Motors Corp., General Motors Bldg., Detroit, Mich. Bids Aug. 16, awarded Dec. 17. CD 8/9.

Dahlman Constr. Co., Box 1184, Milwaukee, Wis., LB **$997,000**, general contract SHOP and TECHNICAL BLDG. MILWAUKEE, WIS. Bd. Vocational & Adult Education, 1101 N. 6 St., Milwaukee, 3, Wis. Bids Dec. 19. CD 11/20.

The Austin Co., 227 Curtis Bldg., Detroit, Mich., CA. Approx. **$670,000**. 4 story brick, steel, concrete HOSPITAL, OWOSSO, MICH. Owosso Memorial Hospital Bd. Trustees, Harlow Ross, pres., Owosso, Mich. CD 9/5.

▲ **Foster-Wheeler Corp.**, 165 Broadway, New York, N. Y. CA **$2,200,000**. design and construct synthetic anhydrous ammonia PLANT, WYANDOTTE, MICH. Pennsylvania Salt Manufacturing Co., 4655 Biddle St., Wyandotte, Mich. CD 3/12/47.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

Wyoming—RURAL DISTRIBUTION LINES—B.A. 1/15—Hot Springs Co. Rural Electric Assn., Thermopolis, 324.82 mi. rural distr. lines, Carbon, Fremont and Natrona Counties, $400,000, C-B. Engineering Co., 25 S. Grove St., Denver, Colo., engr. CD 11/28/50.

† **Okla., Camp Gruber**—B.A. 1/17—U. S. Eng., P. O. Box 6, Tulsa, construct new spillway on Greenleaf Lake. $60,000. CD 1/15/51.

† **Texas**—B.A. 1/17—U. S. Eng., Box 61, Tulsa, Okla., rip rap on Denison Dam, Inv. No. CIVENG 34-066-52-11. CD 12/12.

▲ † **South Dakota**—B.A. 2/15—U. S. Eng., 1709 Jackson St., Omaha 2, Neb., construct Spillway-Stage II for Fort Randall Reservoir Proj. near Lake Andes, Spec. No. CIVENG 25-066-52-59. CD 5/25/44.

Tex., Texas City—TANK FARM and DOCKAGE—Bids Asked—Republic Oil Refining Co., Texas City, steel tank addns. to tank farm, $450,000; dockage, $175,000. CD 12/21.

BIDS ASKED—BUILDINGS

▲† **Colo., Denver**—TECHNICAL TRAINING BLDGS.—B.A. 1/15—U. S. Eng., 1709 Jackson St., Omaha, Neb., technical training bldgs. and appurtenant facilities, Eng 25-06-52-35. Plans deposit $100. Extended date. CD 12/11.

▲† **N. M., Los Alamos**—PHYSICS—B.A. 1/15—U. S. Atomic Energy Comn., Los Alamos, physics bldg. $2,500,000-$3,000,000. Plans deposit $50. Extended date. CD 10/25.

▲ **Tex., Austin**—HIGH SCHOOL—B.A. 1/17—Austin Independent School Dist., Austin, West Austin Junior High School. $1,200,000. Extended date. Arthur Fehr & Charles Granger, 502 E. 5 St., archts. CD 12/12.

Tex., Rockport—HIGH SCHOOL—B.A. 1/22—Aransas County Independent School Dist., Rockport, high school $325,000. Lynn A. Evans & Roy O. Abbott, Bevly Bldg, Corpus Christi, archts. CD 8/24.

▲ **Tex., San Antonio**—HOUSING—B.A. 1/22—San Antonio Housing Auth., 400 Labor St., Tex. 6-6, 400 housing units, Brady Blvd. and Frio City Rd. $3,000,000. Plans deposit $50. Extended date. Ford & Rogers and Sam Zisman, Willow Way, and Widener & Walker, Alamo Natl. Bldg., archts. CD 11/27.

Tex., Victoria—HOUSING—B.A. 1/22—Victoria Housing Auth., Victoria, 130 low-rent housing units in total 19 bldgs., Tex. 85-1 for 102 units and Tex. 85-2 for 28 units. $975,000. Plans deposit $50. Jordan C. Ault & Assoc., 604 E. Goodwin Ave., archts. Lockwood & Andrews, Union Natl. Bank Bldg., Houston, engrs. CD 7/18.

Minn., Austin—POWER PLANT—B.A. 1/29—City, Bd. Water, Electric, Gas & Power Comrs., W. D. Dunlap, secy., furnish, install power plant equip., incl. turbine generator and auxiliaries, surface condenser,

etc. $900,000. Plans deposit $30. J. V. Edeskuty, 1418 Foshay Tower, Minneapolis, engr. CD 12/4.

Tex., Brenham—HOSPITAL—B.A. 1/29—Sisters of St. Francis, Brenham, Tex., 3 story, bsmnt., 42x185 ft., brick, hollow tile, hospital, concrete fdn., $600,000. Plans deposit $25. The Walter Butler Co., 1300 Minnesota Bldg., St. Paul, Minn., archt. CD 9/25.

▲ **Tex., Texas City**—REFINERY UNITS—Bids Asked—Republic Oil Refining Co., Texas City, 6,500 bbl. daily capacity platforming unit, $3,750,000; crude distillate units, $3,800,000; general power unit, $550,000; 2nd floor to laboratory, Approx. $300,000. CD 12/21.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **U. S. Eng.,** 1709 Jackson St., Omaha, Neb. received no bids Dec. 18, emergency levee repairs along Missouri River, near Pacific Junction, Inv. 52-56, IOWA. Will re-advertise. CD 12/11.

Beasley Constr. Co., 20 N. Wacker Dr., Chicago, Ill., LB, $704,123, Contr. 1, reconstructing existing bridge with new 20 ft. open steel deck roadway and new steel sidewalk; LB $789,330 Contr. 2, reconstructing existing bridge with new 22 ft. open steel deck roadway and new cantilevered steel sidewalk MacArthur Bridge across Mississippi River, BURLINGTON, IA. City Council, City Hall, Burlington, Ia. Bids Dec. 13. CD 11/30.

W. T. Conroy, 1525 Locust St., Kansas City, Mo., CA. $573,860, power piping for power at MISSOURI CITY, MO. Northwest Electric Power Co-operative, Inc., F. A. Martz mgr., 312 N. Chestnut St., Cameron, Mo. Bids Nov. 28. CD 12/7, under LB.

▲ **KANSAS**—State Hy. Comn., Wichita,

Freeto Constr. Inc., Pittsburg, Kan., CA $105,295, 80 ft., 100 ft., 100 ft., 100 ft., 80 ft. plate girder span, Bridge 15-18-37.2 Station 441 plus 41, 15-18 F047-1(1) Cowley Co.;

Swenson Constr. Co., 3305 Terrace St., Kansas City, Mo., CA, $1,013,873, 2,072 ft., 1½ in., 24 in. and 36 in. WF continuous I-beam viaduct (timber pile footing alternate) Bridge 54-87-UG596 (8), Sedgwick Co. Bids Dec. 5. CD 11/23.

Sesto Constr. Co., 3320 N. 48 Ave., Omaha, Neb., LB $86,891, storm sewer in 50 St. between Dodge and Howard Sts., OMAHA, NEB. City, City Hall, 18 and Farnam Sts., Omaha, Neb. Bids Dec. 18. E. W. Woodbridge, city engr. CD 4/9/51.

† **Westinghouse Electric Corp.,** 619 S. Main St., Tulsa, Okla., CA. $189,802, switchgear, switchboards and associated equip. for installation at Tenkiller Ferry Dam, OKLAHOMA. U. S. Eng., Box 61, Tulsa 2, Okla. Bids Oct. 9. CD 10/1.

E. E. Farrow, Praetorian Bldg., Dallas, Tex., CA. $404,-980, est. $400,000, power plant piping for steam electric generator PLANT, ANADARKO, OKLA. Western Electric Co-operative, Anadarko, Okla. Awarded Dec. 4. CD 12/15/50.

Myron Groseclose, Bethany, Okla., LB $73,748, est. $67,292, c. conc. pavement Dist. 1162, OKLAHOMA CITY, OKLA. City, City Hall, Oklahoma City, Okla. Bids Dec. 4. CD 11/21.

Jim Wells Co., Court House, Alice, Tex., Own Forces. $65,000. Precinct 3, addnl. farm to market road imprvs., repairing and some flood prevention; $80,000, Precinct 4, addnl. farm to market road imprvs., repairing and flood prevention, ALICE, TEX. W. W. Coym, Alice, Tex., engr. CD 10/30.

▲ **San Jacinto Equipment Co.,** 1107 Girard St. and **Elmer C. Gardner, Inc.,** 2704 Sachett St., Houston, Tex., CA. $6,216,295, San Jacinto River Dam, HOUSTON, TEX. City, City Hall, 900 Brazos St., Houston, Tex. Bids Dec. 11. CD 12/17, under LB.

▲ **Bethlehem Steel Co.,** E. 3 St., Bethlehem, Pa., LB, $1,283,170, est. $1,350,000, water line, pipe, incl. 98,000 lin. ft. 16- to 40-in. steel pipe, COLORADO SPRINGS, COLO. City, City Hall, Colorado Springs, Colo. Bids Dec. 18.

† **Peter Kiewit Sons Co.,** 1950 S. Colorado Blvd., Denver, Colo., LB, $845,977, aprons and taxiways, at Lowry Air Force Base, DENVER, COLO. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Dec. 14. CD 12/7.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **I. E. Millstone Constr. Co.,** 4343 Clayton Ave., St. Louis 10, Mo., LB $20,670,000, construct 1,736 DWELLING units, incl. twenty 11-story brick, reinf.-con. apartments demolition certain bldgs., Proj. MO 1-4, ST. LOUIS, MO. St. Louis Housing Auth., Gerard B. Cleary, exec. dir., 901 Washington Ave., St. Louis, 1, Mo. Bids Dec. 20. CD 12/14.

J. E. Pyle Constr. Co., Commercial Bank Bldg., Little Rock, Ark., LB, $369,109, general contract Junior High SCHOOL, NORTH LITTLE ROCK, ARK. North Little Rock School Bd., North Little Rock, Ark. CD 6/1.

Home Builders, Inc., c/o Mayor Neal Giesecke, Angleton, Tex., Owner Builds. $300,000. 35 DWELLINGS, ANGLETON, TEX. CD 11/14.

Whipple Constr. Co., 4015 Fernwood St., Houston, Tex., Owner Builds, Approx. $300,000. 38 DWELLINGS, ANGLETON, TEX. CD 11/9.

Carpenter Brothers, 1335 Plowman St., Dallas, Tex., LB $738,000, est. $650,000. Junior High SCHOOL, SCHOOL addns., MUSIC BLDG., Coleman Elementary SCHOOL, Cooke Elementary SCHOOL, HOMEMAKING BLDG. CLEBURNE, TEX. Cleburne Independent School Dist., Cleburne, Tex. Bids Dec. 20. CD 12/11.

The Austin Co., M & M Bldg., Houston, Tex., CA. Approx. $875,000. 3 story department STORE, CORPUS CHRISTI, TEX. Federated Department Stores, Inc., 1440 Broadway, New York, N. Y. and c/o Foley's, 1110 Main St., Houston, Tex.

Archie C. Fitzgerald, Box 101, Austin, Tex., LB $359,-000. Tuberculosis HOSPITAL, CORPUS CHRISTI, TEX. Nueces Co., Court House, Corpus Christi, Tex. Bids Nov. 14. CD 11/20.

W. Robert Browns & Neil I. Holm, 5322 Maple St., Dallas, Tex., Own Forces. Approx. $300,000. 40 addnl. DWELLINGS, in Briley Heights, GARLAND, TEX. CD 11/7.

L. W. Nelms, pres. Nelms Lumber Co., 5214 Airline St., Houston, Tex. Owner Builds. $390,000. addnl. 48 DWELLINGS, HOUSTON, TEX. E. M. Kirkland, Hermann Bldg., Houston, Tex. archt. CD 12/13.

▲ **Phillips Chemical Co.,** subsidiary Phillips Petroleum Co., Bartlesville, Okla., and c/o City National Bank Bldg., Houston, Tex., Own Forces. $2,500,000. CHEMICAL PLANT to mfg. pyridine, HOUSTON, TEX. CD 8/15.

Oak Meadows Addition, D. D. Hutchinson, pres., 6319 Long Dr., Houston, Tex., Owner Builds. $355,000. Proj. No. 1. 34 DWELLINGS, HOUSTON, TEX. CD 10/23.

J. A. Sharrock & Sons, Box 268, Marshall, Tex., CA. $800,000. 4 masonry elementary SCHOOLS, concrete slab fdns., LONGVIEW, TEX. Longview Independent School Dist., Longview, Tex. Bids Dec. 18. CD 12/3.

LeTourneau Technical Institute of Texas, Longview, Tex., Purchase and Hire. $310,000. 40 low-cost rental HOUSING units, LONGVIEW, TEX. CD 12/14.

Calhoun Development Co., Port Lavaca, Tex., CA. Approx. $375,000. Proj. 3, 38 DWELLINGS, POINT COMFORT, TEX. Aluminum Co. of America, Port Lavaca, Tex. CD 11/20.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Wash., Tacoma**—WAREHOUSE—B.A. 1/15—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, 200x200 ft. warehouse (ADC) McChord Air Force Base, Eng. 45-108-52-124, $400,000. Plans deposit $25. CD 12/19.

† **Washington**—B.A. 1/29—Bureau Reclamation, Dpt. Interior, Ephrata, earthwork, structures for Potholes East Canal, Station 2489 plus 42 to Station 3536 plus 23, and Pasco wasteway, Station 0 plus 00 to Station 15 plus 96, Columbia Basin Proj., west of Eltopia, Spec. DC 3619; adv. ENR 1/3.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **J. G. Watts Constr. Co.,** 3419 16 Ave. W., Seattle, Wash., CA, $3,719,000, est. $5,000,000 design, construction, installation and testing high frequency radio station for Voice of America, COPALIS, WASH. State Dpt., 21 St. and Virginia Ave. N.W. Wash., 25, D. C. Bids Oct. 31. CD 11/7, under LB.

Hoagland-Finley Eng. Co., 607 3 Ave. W., Seattle, Wash. CA, $723,700, sewage treatment plant, SEATTLE, WASH. Lake City Sewer Dist., 3622 E. 105 St., Seattle, Wash. Bids Nov. 1. CD 11/8, under LB.

▲ **Oberg Bros. Constr. Co.,** 401 W. Florence Ave., Inglewood, Calif., CA. $1,411,889, ventilating, drainage, grading, paving, etc. for Sepulveda Blvd. Subway, LOS ANGELES, CALIF. City, City Hall, Los Angeles, Calif. Bids Sept. 26. CD 8/28.

▲† **The George W. Carter Co.,** 1721 W. Olympic St., Los Angeles, Calif., LB $1,783,588, construct supply and public works bldgs., at Naval Air Missile Test Center, Spec. 32575 POINT MUGU, CALIF. P. Wks. Office, U. S. Naval Air Missile Test Center, Point Mugu, Calif. Bids Dec. 18. CD 11/28.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **School Dist. 411,** Twin Falls, Idaho, rejected bids Nov. 15, general contract HIGH SCHOOL, GYMNASIUM and SHOP, TWIN FALLS, IDAHO. LB. $1,540,754. Will re-advertise. CD 11/23, under LB.

† **J. G. Watts Constr. Co.,** 3419 16 Ave. W., Seattle, Wash., LB, $862,490, 108 prefabricated HOUSES, at 9 undesignated locations in Pacific Northwest, WASHINGTON. U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash. Bids Dec. 7.

▲† **U. S. Eng.,** 4735 E. Marginal Way, Seattle, 4, Wash., rejected bids, five 200x800 ft. masonry, steel warehouse at Auburn General Depot, ENG 45-108-52-52, AUBURN, WASH. LB. $3,827,782. Will re-advertise. CD 11/14, under LB.

▲ **Bank Building & Equipment Corp. of America,** 906 Sidney St., St. Louis, Mo., CA. Approx. $1,000,000, 8 story, 90x90 ft., rein.-con. OFFICE, SPOKANE, WASH. Fidelity Savings & Loan Assn., W. 522 Riverside St., Spokane, Wash.

▲† **Strand & Son,** 3939 University Way, Seattle, 4, Wash., LB, $756,098, two 165-man BARRACKS, at Madigan Army Hospital, Inv. 52-84;

Mowat Bros. Constr. Co., 2833 Eastlake Ave., Seattle, Wash., LB $634,040, BARRACKS, WARDS, covered walks and facilities, Madigan Army Hospital. ENG 45-108-52-86, Fort Lewis, TACOMA, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash. Bids Dec. 18. CD 11/28.

† **Zoss Constr. Co.,** 401 N. Avenue 19, Los Angeles, Calif., LB, $1,364,504, 200x1200 ft. general supply WAREHOUSE at Mt. Rainier Ordnance Depot, ENG 45-108-52-57, TACOMA, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash. Bids Dec. 20. CD 12/4.

▲† **Barry J. Richards,** Box 733, Sherman Oaks, Calif., CA $1,198,000, permanent DORMITORY facilities at Station, NOY 71188, Spec. 32742, INYOKERN, CALIF. Naval Ordnance Test Station, Inyokern, Calif. Bids Dec. 4. CD 12/13, under LB.

▲ **Allison Honer Co.,** 31 N. Main St., Santa Ana, Calif., CA, $1,265,979, 4 story, rein.-con. Ventura County HOSPITAL addn., VENTURA, CALIF. Bd. Supervs., Ventura Co. Court House, Ventura, Calif. Bids Nov. 27. CD 12/4, under LB.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

† **Alaska**—SERVICE CLUB—B.A. 1/17—U. S. Eng., (APO 942, c/o PM, Seattle, Wash.) Anchorage, 1 story, 63x137 ft. and 30x80 ft. concrete enlisted men's service club, Ladd Air Force Base, S95-507-52-17. $375,000. Plans deposit $25. CD 12/18.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **S. Birch & Sons,** Ford Bldg., Great Falls, Mont., and **Lytle-Green,** 312 Masonic Temple Bldg., Des Moines, Ia., LB $582,158, est. $598,238, roads, streets, lighting, drainage and other utilities, Inv. 52-33, Elmendorf Air Force Base, ALASKA. U. S. Eng. (APO 942, c/o PM, Seattle, Wash.) Anchorage, Alaska, Bids Dec. 21. CD 11/27.

BUILDINGS

LOW BIDS AND CONTRACTS

† **U. S. Eng.** (APO 942, c/o PM, Seattle, Wash.) Anchorage, Alaska, rejected bids July 25, Army COMMUNICATIONS STATION, KENAI, ALASKA. LB $6,-329,364. CD 7/31, under LB.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

ALBERTA—Dpt. Resources & Development, Ottawa, Ont. Own Forces, $60,000. bridge replacement at Spray River at Banff. C. W. F. Weir, c/o owner, engr. CD 8/4/50.

▲ **Comstock Mid Western Ltd.,** 206 Laird Dr., Leaside, Ont., CA, Approx. $55,517,000, 470 mi. section oil pipe line from Edmonton, Alta to Vancouver, B. C.

Mannix Ltd., 332 7 Ave. W., Calgary, Alta., CA, Approx. $26,300,000 223 mi. section oil pipe line from Edminton, Alta. to Vancouver, B. C., ALBERTA and BRITISH COLUMBIA Transmountain Oil Pipe Line Co., c/o S. B. Bechtel & Assoc., 3780 Wilshire Blvd., Los Angeles, Calif., U. S. A. CD 11/8, under British Columbia.

Municipality, Edmonton, Alta., Own Forces. $152,334, relief sewers, sanitary sewers, EDMONTON, ALTA. J. D. A. MacDonald, City Hall, engr. CD 10/29.

M. J. Sulphur & Sons, Ltd., 278 Raglan St., Renfrew, Ont., CA. $28,000. water mains, RENFREW, ONT. Municipality, Town Hall, Renfrew, Ont. D. S. Fraser, c/o owner, engr.

Spino Constr. Ltd., 10156 Blvd. St. Lawrence, Montreal, Que. CA $200,000. sanitary and storm sewers at R.C.A.F. Station, ST. HUBERT, QUE. Govt. of Canada, Dpt. National Defence AIR, Cartier Sq., Ottawa, Ont. Bids July 24. CD 7/11.

Bird Constr. Co. Ltd., 24 Dominion Bank Bldg., Moose Jaw, Sask., CA, Approx. $900,000. 120 unit HOUSING DEVELOPMENT at Air Force Base, MOOSE JAW, SASK. Central Mortgage & Housing Corp., Kensington Bldg., Winnipeg, Man. Bids Nov. 13, awarded Dec. 15. CD 11/8.

BUILDINGS

LOW BIDS AND CONTRACTS

Poole Constr. Co. Ltd., 2402 2nd st., Calgary, Alta., CA. $110,000. concrete, brick WAREHOUSE, CALGARY, ALTA. MacMillan Sales (Alta.) Ltd., 12215 127 Ave., Edmonton, Alta. Rule, Wynn & Rule, 513 8th Ave., Calgary, Alta., archts.

▲ **Smith Bros. & Wilson Ltd.,** 1267 Richards St., Vancouver, B. C., CA, $1,304,843, 150 permanent married QUARTERS, COMOX, B. C. Defence Construction (1951) Ltd., 360 Homer St., Vancouver, B. C. Bids Nov. 27, awarded 12/17. CD 11/8.

▲ **McKay-Cocker Constr. Ltd.,** 233 Dundas St., London, Ont., CA, $2,493,000, 410-bed, 6 story, steel, frame HOSPITAL WING, Ottaway Ave., LONDON, ONT. Victoria Hospital Trust, Wm. Loveday, chn., London, Ont. CD 12/11, under LB.

▲ **Rex Heslop Homes Ltd.,** Brown's Line, Etobicoke, Toronto, Ont., CA, $1,170,000, 117 HOUSING units, as part of defence housing development near airplane plant, MALTON, ONT. Central Mortgage & Housing Corp., 441 Queens Corp., W., Toronto, Ont. Awarded Dec. 19. CD 11/29.

Anglin-Norcross Ontario Ltd., 57 Bloor St. W., Toronto, Ont., CA, $1,000,000, 1 story, 100x280 ft., concrete, brick FACTORY, TORONTO, ONT. Acme Steel Co. of Canada Ltd., 16 Church St., Toronto, Ont. Awarded Dec. 22. CD 11/28.

J. F. Wickenden & Co. Ltd., Ameau Bldg., Three Rivers, Que. CA $300,000. ARMORY, DRUMMONDVILLE, QUE. Govt. Canada, Dpt. National Defence ARMY, Cartier Sq., Ottawa, Ont. M. P. McAndrew, 1247 Guy St., Montreal, Que., engr. CD 10/31.

† **G. H. Dupuis Ltd.,** 4324 Jeanne d'Arc St., Montreal, Que. CA $500,000. BARRACKS at R.C.A.F. Station, LACHINE, QUE. Govt. Canada, Dpt. National Defence AIR, Cartier Sq., Ottawa, Ont.

(Proposal Advertisements see p. 70)

OFFICIAL PROPOSALS

RATE: THE RATE FOR OFFICIAL PROPOSAL ADVERTISING IS $1.25 PER LINE (OR FRACTION) PER INSERTION.

CLOSING DATE: FRIDAY 10:30 A. M. FOR THE ISSUE DATED THE FOLLOWING THURSDAY.

SEND COPY TO: OFFICIAL PROPOSAL DIVISION, ENGINEERING NEWS-RECORD, 330 W. 42ND ST., NEW YORK 36, N. Y.

Bids: January 21, 1952

Canal Improvement

STATE OF NEW JERSEY
DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY AND SUPPLY

Sealed proposals for the construction of the "South Bound Brook Control Structure" on the Delaware and Raritan Canal in the Borough of South Bound Brook, Somerset County, New Jersey, will be received by the Division of Water Policy and Supply at its office, Room 307, 520 East State Street, Trenton, N. J., until 10 a.m. (E.S.T.) Monday, January 21, 1952, at which time and place the bids will be publicly opened and read.

The work includes the removal of existing timber bulkhead and original timber gate structure and operating machinery; constructing new reinforced concrete gate structure, wing walls; installation of three sluice gates, repair of old lock walls, coffer dams and pumping, miscellaneous work, restoring site. Approximate quantities involved are: Foundation excavation 275 cu. yds.; rock excavation 150 cu. yds.; Concrete (Class D), 150 cu. yds.; concrete (Class B), 250 cu. yds.; reinforcing steel 12,000 lbs.

Drawings, specifications, form of bid, contract and bond for the proposed work will be on file at the Canal office of the Division, 342 Academy Street, Trenton, N. J., and may be inspected by prospective bidders during regular office hours. Plans will be furnished on the deposit of $10 for for each set on application to the Canal Office.

Bids must be made on standard proposal forms and must be submitted in sealed envelope bearing the name and address of the bidder on the outside, marked "Proposal for South Bound Brook Control Structure", and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey in the amount of ten per cent of the bid submitted, and must be delivered at the above place on or before the time stated. Copies of standard proposal forms will be furnished on application. Prequalification of bidders will be required. The right is reserved to reject any or all bids. BY ORDER OF THE WATER POLICY AND SUPPLY COUNCIL, John Wyack, Secretary.

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION. NOTICE IS HEREBY GIVEN that sealed bids on Specifications No. 703C-227 for furnishing labor and materials and performing all work for installing armor rods and attaching vibration dampers to overhead ground wires on the existing Casper-Gering and Gering-Alliance 115-kilovolt transmission lines, Transmission Division, Wyoming-Nebraska, and Nebraska, Missouri River Basin Project, will be mailed to P. O. Box 280, Casper, Wyoming, or delivered to the office of the Bureau of Reclamation in time for the public opening at 10:30 a.m., Mountain Standard Time, January 17, 1952, at the office of the Bureau of Reclamation, Reclamation Center, Casper, Wyoming.

Copies of the standard forms and of the specifications may be obtained from the following offices of the Bureau of Reclamation: Avery A. Batson, Regional Director, Building No. 46, Denver Federal Center, Denver, Colorado; and I. J. Matthews, District Manager, P. O. Box 280, Casper, Wyoming. No charge for copies of the specifications and drawings furnished for bidding purposes; for all others $0.50 per copy, not returnable. Payments should be made by check or money order payable to the Treasurer of the United States.

Bids: January 9, 1952

New York State Highway Works

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., Eastern standard time on Wednesday, January 9, 1952 by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 3				
		WILLIAM ROBINSON, Dist. Engr., Weigh Lock Bldg., Syracuse 1, N. Y.				
Cay. Cort. Onon. Oswe. Sen. Tomp.	R.C.52-3	Tree Removal on Various Highways in Dist. 3	....	Removal of 273 Trees	$800 Plans $10	15,000
		DISTRICT No. 4				
		A. B. MULLIGAN, Dist. Engr., Barge Canal Terminal, Rochester 1, N. Y.				
Monroe	O.T.52-1 R.C.52-1 S.T.52-1	N. Y. State Thruway-Ontario Section (Subdivisions 8B & 9) (Access 2.25) Rush-Henrietta S. H. 1283 West Henrietta-Rochester S.H. 62 East River Rd; Middle Rd.; Henrietta-Pittsford .T.L. Pinnacle Rd.	6.14	9" Cem. Conc. Pavt. 2 @ 25' = 5.64 Mi. Misc. Work = 2.75 Mi.	$160,000 Plans $50	3,067,000
Monroe	LOSP52-1P	Lake Ontario State Parkway Sect. A (Park & Service Roads in Hamlin Beach State Park)	1.31	Bit.Mac.Ty.I, P.M.	$3,000 Plans $10	51,000
Monroe	FASH52-1 FARC52-4	Winton Road-Seabreese Pt. 1 Fidge-Rochester-SeaBreeze S. H. 538, Proj. U-1097(1)	2.53	9" Cem. Conc. Pavt. 48'-54' wide = 1.99 Mi. Bit. Mac. Opt. 0.54 Mi.	$80,000 Plans $15	1,414,000
		DISTRICT No. 8				
		J. S. BIXBY Dist. Engr., Pleasant Valley Road, Poughkeepsie, N. Y.				
West.	R.C.52-5	Bear Mountain Bridge: East Approach S. H. 9297	2.48	Cable Guide Rail Opt.	$700 Plans $10	13,000

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3620) will be received by Bureau of Reclamation, Albuquerque, New Mexico, until February 5, 1952, and then publicly opened for furnishing labor and materials and performing all work for the construction of channelization of the Rio Grande from Fish and Wildlife Refuge to San Marcial, Middle Rio Grande Project, New Mexico. The work is situated between San Marcial and San Antonio, New Mexico. Principal items are approximately: 2,500 acres clearing; 1,950,000 cu. yds. excavation; 11,800 cu.yds riprap; 275 cu.yds. concrete; and other work. Time allowed for completion will be 450 days. For particulars, address Bureau of Reclamation, Albuquerque, New Mexico; or Building 53, Denver Federal Center, Denver, Colorado.

OFFICIAL PROPOSALS

Bids: January 17, 1952

Two 10,000 Gallon Fuel Oil Tanks New York International Airport, Queens, N. Y.

THE PORT OF NEW YORK AUTHORITY
CONTRACT O & M 143

Sealed proposals for furnishing labor and material to install two 10,000 gallon fuel oil tanks at New York International Airport, Queens, N. Y. Will be received at the office of the Director of Purchase of the Port of New York Authority, room 1402, 111 8th Ave., New York 11, until 11:00 A.M., Thursday, Jan. 17, 1952, at which time and place said proposals will be publicly opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase. THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

OFFICIAL PROPOSALS

(Continued from opposite page)

Bids: February 1, 1952

Additions to Sewage Treatment Works

Notice is hereby given that sealed bids or proposals for constructing additions to the existing sewage treatment works of the City of York, located on Codorous Creek, north of York, Pa., will be received by the York City Sewer Authority at the City Hall, York, Pa., up to 2:00 P.M. o'clock, E.S.T. on the 1st day of February, 1952 at which time they will be publicly opened and read aloud in the City Hall. The work will be divided into four (4) contracts, as designated as follows:

Contract No. 1—Structural & Mechanical Work
Contract No. 2—Plumbing Work
Contract No. 3—Electrical Work
Contract No. 4—Heating Work

All bids should be addressed to the York City Sewer Authority, City Hall, York Pa., and shall be placed in a sealed envelope sufficiently labeled to indicate that it is a bid for this work, copies of the plans, specifications and other contract documents are on file and open to public inspection and may be procured at the office of Albright & Friel, Inc., Consulting Engineers, 121 South Broad Street, Philadelphia 7, Pennsylvania, and at the office of the City Engineer, City Hall, York, Pa. after Jan. 2, 1952 and sets of the documents may be obtained during any business hour at either the offices of the said Consulting Engineers, or the office of the City Engineer upon paying a deposit of $60.00 for each set of documents. If the documents are returned in good condition within five (5) days after the opening of bids, the full amount of the deposit for one set will be refunded to each actual bidder; and other deposits will be refunded with a deduction of $30.00 to defray the actual cost of reproduction of the sets of the documents. If the said documents are not returned within the time stated, the entire amount of deposit will be forfeited.

A bid bond or certified check made payable to the York City Sewer Authority in the amount of five (5%) percent of the bid must be deposited by each bidder with his bid as a guarantee that in case any contract is awarded to him, he will execute the contract and furnish the bonds required.

The York City Sewer Auth. hereby reserves the right, which is understood and agreed to by all bidders, to refuse and reject any or all bids submitted hereto, and, if the Authority deems it necessary, to readvertise for bids; the said Authority also reserves the right to waive any informality in bids received, but any contract awarded will be to the lowest responsible bidder.

No bid may be withdrawn by the bidder for forty-five (45) days after the scheduled closing time for receipt of bids.

The National Production Authority has assigned a DO-T-8 Rating and a T-8 Allotment to this project.

SAMUEL W. HARBOLD
SECRETARY OF THE AUTHORITY
Date December 20, 1951

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3619) will be received by Bureau of Reclamation, Ephrata, Washington, until January 29, 1952, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork and structures for Potholes East Canal, station 2489+42 to station 3536+23, and Pasco wasteway, station 0+00 to station 15+96, Columbia Basin Project, Washington. The work is situated west of Eltopia, Washington. Principal items are approximately: 865,000 cu.yds. excavation; 88,000 cu.yds. core banks; 2,200 cu.yds. concrete; 11 radial gates and hoists; 19,000 lbs. slide gates and metalwork; and other work. Time allowed for completion will be 560 days. For particulars, address Bureau of Reclamation, Ephrata, Washington; or Building 53, Denver Federal Center, Denver, Colorado.

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THIS WEEK AND EVERY WEEK

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New Advertisements received by January 7th will appear in the January 17th issue.

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POSITIONS VACANT

CONSTRUCTION FIRM Operating in Western New England has opening for Office Engineer on building estimating and some structural design. Salary open. P-2843, Engineering News-Record.

DESIGNERS FOR highway and bridge work in Rhode Island. Send experience to P. O. Box 814, Providence, Rhode Island.

ENGINEER EXPERIENCED in general municipal work including construction of water and sewer lines, pavements, and drainage facilities, maintenance of streets, public grounds and buildings, to supervise operation of engineering and service departments of rapidly growing residential community in Metropolitan Cleveland. Good pay with opportunity for increase. Submit full resume, stating experience, education, age, availability and salary expected. P-2746, Engineering News-Record.

ENGINEER, EXPERIENCED, first class, civil or mechanical, for either office or field work. Write P. O. Box 1106, Roanoke, Va.

ESTIMATOR—FOR General Contractor on all types of heavy construction—Bridges, Steel Erection, Pile Driving, Dock Work, all types of Highway Construction. Permanent location in New Jersey. P-2858, Engineering News-Record.

FORM DESIGNER—Engineer For General Contractor specializing in Bridge Construction. Location—Southern New Jersey. P-2856, Engineering News-Record.

(Continued on page 72)

Permanent Positions Open to
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to top U. S. and Canadian industry. Usual pension and other benefits. Excellent opportunities; fast-growing engineering organization.
Write complete qualifications to:
P-2447, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

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Location
El Salvador, Central America
Concrete inspection gravity concrete dam now under construction. Several years experience. 4"-6" aggregate necessary. Living quarters available. Duration of job about one year or longer. Reply, giving experience, photograph, salary desired, etc. to
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ENGINEERS

Opportunities now available for men with heavy industrial experience in the following phases of design: mechanical, electrical, structural, piping, civil.

FOR WORK IN OAKLAND HOME OFFICE

Write outlining experience to

KAISER ENGINEERS
Division of Henry J. Kaiser Co.
Dept. A, 1924 Broadway
Oakland, California

HYDRO-CONSTRUCTION ENGINEERS

Hydro-Construction Engineers with 10 to 15 years experience on hydro-electric power plant construction, wanted by large engineering and construction organization. Also, position available for Assistant Hydro-Construction Engineer. College graduates preferred. Location Pacific Northwest. Submit resume of experience; salary desired, and date available.

P-2555, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

WANTED MINING ENGINEER

Reside abroad part of year — must be qualified organize mining operations, transportation, etc., metallic ore mines—reply box

P-2707, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

POSITIONS VACANT
(Continued from page 71)

WANTED—CIVIL Engineer graduate, some experience in the use of concrete masonry in the housing field preferred, by long established engineering promotional and educational organization, to be representative in the Metropolitan New York area. Age 25 to 40. Give resume of education, engineering experience, and salary requirements in reply. P-2816, Engineering News-Record.

ENGINEERS ON Design of water and sewage treatment projects in consulting engineers office. Northwestern Ohio. P-2668, Engineering News-Record.

STRUCTURAL STEEL Detail Draftsmen and Checkers. All types of Structures. Vacation, group insurance, good working conditions. Only top quality men. Send complete written information. Bristol Steel & Iron Works, Inc., Bristol, Virginia-Tennessee.

SELLING OPPORTUNITY OFFERED

SALES ENGINEER for large concern in construction field. Must have degree in civil engineering. Prefer person having experience in contracting engineers and contractors. Desire resident of Kentucky, as position is located in Louisville. RW-2740, Engineering News-Record.

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ENGINEERS NEEDED in all fields at all levels. Salaries commensurate with experience & ability. Highly confidential service. Bring or mail 3 resumes to: Position Securing Bureau Inc. (Agency), 45 John St., N. Y. 38, N. Y.

POSITIONS WANTED

CIVIL ENGINEER, honor grad., registered, 4 years experience industrial design and construction, 3 years experience technical sales promotion. PW-2799, Engineering News-Record.

CIVIL ENGINEER: Consulting, Registered; 20 years experience—Sewerage systems, Water supply, Town Planning, Municipal Engineering Projects. Emphasis on connection of responsibility or future partnership possibility. PW-2870, Engineering News-Record.

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P-2807, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS WANTED

CONSTRUCTION SUPERINTENDENT & Engineer, twenty years practical experience on all types of buildings, bridges, heavy construction and architectural buildings, good organizer and knows costs, excellent references, prefers midwest location. PW-2864, Engineering News-Record.

CONSTRUCTION EXECUTIVE: 46, New York Registration, with wide experience in planning, coordinating and directing the development and construction of industrials, public works and transportation facilities as Chief Engineer-Estimator and Contract-Construction Manager, is interested in a career job offering economic security. PW-2871, Engineering News-Record.

CONSTRUCTION MANAGER available. Engineering education, have numerable contacts and broad experience in both domestic and foreign construction. Wishes permanent connections with responsible construction company who realizes the importance of know-how and dependability. Age 45. PW-2866, Engineering News-Record.

ENGR., 27, presently employed, solid field and office experience, interested in position with small contractor as assistant. PW-2683, Engineering News-Record.

MASTER MECHANIC: Shovel oper., 30 years experience with heavy equipment, 8 years open pit mining, steam, diesel, electric. PW-2868, Engineering News-Record.

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GENERAL CONSTRUCTION SUPERINTENDENT

Experienced in highway, airport, U. S. Flood control construction, also all types of concrete and asphalt paving and all types of sewer and water main installations, have knowledge of some bridge and industrial and structural building and remodeling of commercial stores etc. Age 42 years, college graduate, 16 years experience, will travel and relocate. Have also served as Project Manager. I am also cost conscious not afraid of long hours.

Write or Call

J. H. SMITH
144 Westminster Rd. Rochester 7, N. Y.
Telephone Hillside 3472-J

SALARIED POSITIONS $3,500—$35,000

We offer the original personal employment service (established 42 years.) Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars.

R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N. Y.

POSITIONS WANTED

PROJECT MANAGER or Construction Superintendent, 20 years experience in Industrial and Governmental work. Excellent references. PW-2823, Engineering News-Record.

REGISTERED C.E. Over 20 years engineering experience. Field and office supervision. Design and construction of earthwork, concretework, roads, bridges, sewers, etc. Desires new position. South, Midwest or Southwest preferred. PW-2738, Engineering News-Record.

STRUCTURAL - MECHANICAL Engineer — Assoc. M. ASCE; 39, married, 15 years varied experience, structural, mechanical, design, supervision, for industrial buildings, refineries, power plants and steel mills, seeks stable position of responsibility in Intermountain West. Might consider attractive foreign offer. P. O. Box 1006, Angleton, Texas.

SUCCESSFUL TOP Monumental building and heavy construction man presently in charge of all work for internationally known long established construction company desires immediate change. PW-2585, Engineering News-Record.

SUPT. TUNNELS, Open cut and extensive experience with Hard Rock. PW-2863, Engineering News-Record.

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Professional Engineer

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Divers, equipped and experienced

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BO-2865, Engineering News-Record
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Large engineering firm wishes to acquire several complete plants through purchase of (1) capital stock, (2) assets, (3) machinery and equipment, whole or in part. Personnel retained where possible, strictest confidence.

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The Austin Company plans to give special training to a limited group of high type young men who have had practical experience in the installation of Mechanical Equipment for heating, air conditioning, ventilating systems, boiler room equipment, controls, process piping, sprinkler systems, plumbing, and sewer work for large new industrial plants.

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Please give full particulars as to age, experience, education, and salary desired in first letter, and enclose a recent photograph.

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Prominent mid-western manufacturer of construction equipment has a position available as sales manager for one of its product lines consisting of medium to heavy roadbuilding and excavating machinery. If you have had sales experience in this field . . . can show a successful record demonstrating the executive ability necessary to efficiently manage a sales office and field sales force . . . are able to administer and sales promote a dealer organization of over 200 dealers to a continuing high level of activity in the never ending search for business . . . and are looking for a challenging opportunity, please get in touch with us.

P-2462, Engineering News-Record
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Age 30 to 40 years. Experienced in treatment of industrial plant wastes. Accustomed to client and public relations.

Please forward qualifications, experience, and date available to:

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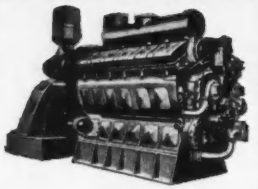
UNIT CAPACITIES—10 TO 1875 KVA

A.C.—50 AND 60 CYCLES

VARIOUS VOLTAGE



A PARTIAL LISTING OF OUR INVENTORY

KVA	Make	Model	HP	RPM	KVA	Make	Model	HP	RPM
1875	Fairbanks Morse	33F16	2000	300	375	Enterprise	DSG-6	450	450
1420	Fairbanks Morse	38D8¼	1600	720	330	Superior	KNA	396	514
1250	General Motors	16-278A	1600	720	312	General Motors	8-268A	450	1200
937.5	General Motors	12-567	1080	720	312	Clark	MD-4	375	327
625	Alco	6-12½x13T	750	600	125	General Motors	3-268A	150	1200
425	Baldwin	VO-6	510	450	75	General Motors	804BC	90	1200
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Crushers, Reduction Type: Symons 2 ft. Cone, coarse bowl. Telsmith 13-B, Gyratory, 13" opening, all steel, 50 H.P. motor.
Dryers or Kilns: 2—10 ft. x 90 ft. heavy duty with or without auxiliary equip., condition like NEW.
Diesel Motor: Cat. D13000 port. on skids, 122 H.P.
Dragline: Lima 1201, long cats, wide treads, 80 ft. boom, 3 yd. capacity, 1949.
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Electric Motors: 2—NEW 1000 H.P., 1800 RPM, 2300 volt, drip proof with automatic switch gear. UNUSED. 1—950 H.P. Hoist Motor, 3 phase, 60 cycle, 2200 volt, with all control equipment.
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60 CFM INGERSOLL (Gas) 2 Pneu
66 CFM WORTH. (Gas) 2 Pneu
105 CFM WORTH. (Gas) 2 Pneu
105 CFM WORTH. (Gas) 4 Pneu
160 CFM WORTH. (Gas) 2 Pneu
160 CFM WORTH. (Gas) 4 Pneu
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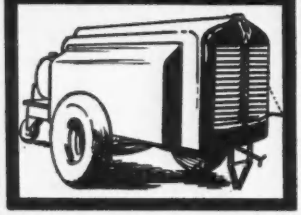

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100 Tons	12"	BP	53#	40'	In Stock
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10 Tons—⅜"	120 Tons—½"
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40 ton Orton Diesel Locomotive Crane
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60 HP American 3 Drum Gas Hoist

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Schramm 105 cubic foot gas powered compressor on 4 steel wheels.
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Cedarapids 2036 AAA unit with feeder, etc.
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4' x 6' Kennedy Van Saun single deck.
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42" x 24' revolving screen.
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80-ton, 2-compartment, 8'x18' storage bin with clamshell gates.
Conveyors—18"—24"—30"—36". Also belt.

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1½-ton Ford with any body.
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2000-gallon tanks on semi-trailer mounting.
New and rebuilt dump bodies.
3,000 gallon tanks on semi-trailer mounting.

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1½ KW to 125 KW, alternating and direct current, gasoline and diesel powered.

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Lorain L-50, 1-yd. diesel. New condition.
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Lorain 41 Chain Crowd Shovel Attachment. Complete.
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Lorain 30 hoe attachment complete.
¾-yd Lorain, 40, LBS #6105. 44" cutting width.
28" outside width solid bottom type LBS #4377, good condition.
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McCaffrey Model 648 for 1¼ to 2-yd crane.
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Lorain 41, ¾-yd. LBS #8600, rebuilt.
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Keystone 70 well drill. Good.
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Bits—Stems—Bailers—Sockets—Etc.

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New Layne Bowler type 18 deep well pump with right angle gear drive. 3000 GPM at 120' TDH.
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40000 Foot Cable, Parkway Hazard —3 cond. #2 Standard, for 2300 V.

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10"	4	1/16"	1/32"	28 Oz.
12"	4	1/16"	1/32"	28 Oz.
14"	4	1/16"	1/32"	28 Oz.
16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
36"	6	1/8"	1/16"	32 Oz.
42"	5	1/8"	1/16"	32 Oz.
48"	5	1/8"	1/16"	32 Oz.
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4 Steam piledriving rigs.
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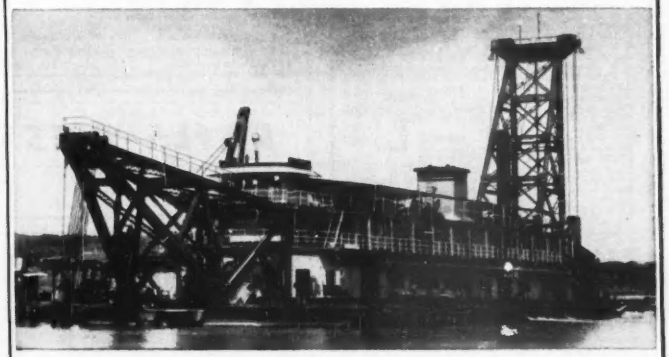

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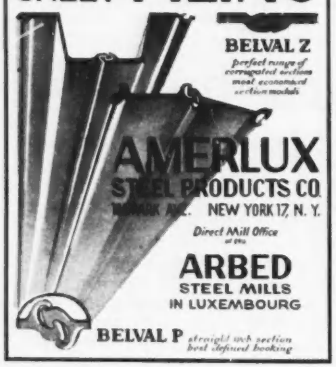

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THIS *"Life Line"* FORETELLS GOOD FORTUNE FOR YOUR PIPING

Every cost sheet today confirms the fact that the most expensive material you can use is that which must be replaced too soon . . . and too often. Premature pipe failure digs deep into your profit pocketbook—directly, through repair or replacements; indirectly, through production tie-ups and disrupted routine.

Users by the thousands have found the answer to lower maintenance in Byers Wrought Iron pipe. They have come to recognize its *red spiral stripe* as a dependable "life line" for predicting future service. They know that when corrosion is a threat to durability, Byers Wrought Iron pipe lives up to the prediction and pays-off in long, trouble-free service.

This time-tested material has rolled up impressive service records in a wide variety of applications. It is serving in thousands of snow-melting systems, of all sizes. Its mechanical strength and proved corrosion resistance make it the first choice for radiant heating systems. In steam and return lines, Byers Wrought Iron pipe has been remarkably effective in eliminating excessive repairs. It has successfully combated corrosive hazards in condenser services, air conditioning systems, underground lines, and sewage disposal plants. Many more services could be added to this list . . . but these will serve to suggest genuine wrought iron's many possibilities.

The next time you approve or specify pipe, investigate the superior performance of genuine wrought iron. You'll find it profitable to do so. For more facts on this time-tested material, write for our bulletin, THE ABC's OF WROUGHT IRON.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, N. Y.

WHY GENUINE WROUGHT IRON LASTS

This notch-fracture test specimen illustrates the unique fibrous structure of genuine wrought iron—which is responsible for the high corrosion resistance of the material. Tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective scale, which shields the underlying metal.

BYERS

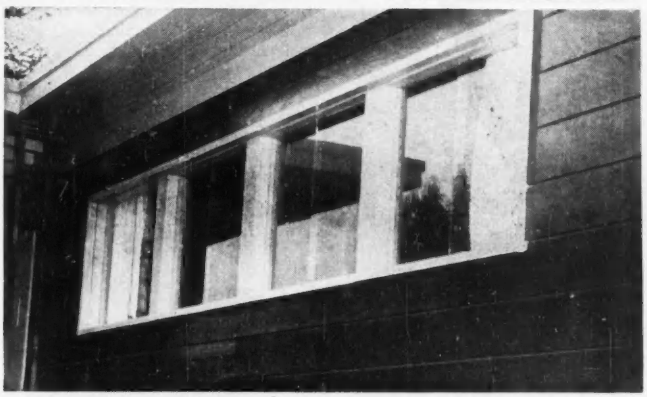
CORROSION COSTS YOU MORE THAN WROUGHT IRON

WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

NEW PRODUCTS



Sashless window

Here is a window that consists of a redwood frame and no hardware, except an ingenious pull-latch which locks the window closed or partly open.

The "Pierson 20-20 Window" comes in seven fabricated redwood pieces, ready to nail together into wall frames. It eliminates sashes, putty and weights; comes in one size, 4 x 3 ft. Two panes of glass are used, one of them sliding. Glass is not included with the fabricated window, however. ERNEST PIERSON CO., EUREKA, CALIFORNIA.

Improved one-man chain saw

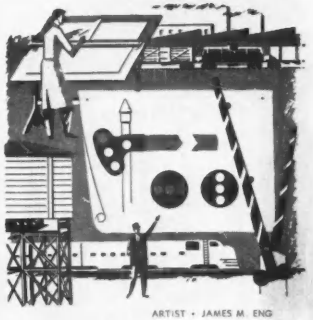
Silver in color and more streamlined, the new Disston DO-101 one-man chain saw features a sturdier crankshaft, rapid-action stop switch, new fan housing and an F (for fast cutting) chain. The chain employs a comparatively small tooth with a lower cutting edge, short pitch and rounded guiding lug which is said to accurately regulate the depth of cut. During tests in Maine it bit through 18-in. sawlogs of dried, hardened red oak in 20 sec; through Carolina pine and poplar of equal size in 15 sec. The "F" will ride around a number of new guide rail lengths with over-all measure of 20, 26, 32, 36 and 40 in., the widest variety yet available.—HENRY DISSTON AND SONS, INC., PHILADELPHIA, PA.

Insecticide mixed with paint

Here's a new approach to the universal problem of insect control. Dianol is mixed with paint and virtually paints insects away in one application. Said to be easily and uniformly mixed with all types of interior and exterior paints including oil, water, and dry paints, as well as whitewash, casein, cement and stucco paints, it brings certain death to all flying, crawling, chewing, and sucking insects, yet is completely odorless and non-toxic to humans and household pets.

Like a pigment, it does not dissolve, but is suspended in the paint. This permanent residual quality is said to remain active throughout the entire thickness of the paint film as well as on the surface and is also said to mean

(Continued on next page)



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New Products . . .

certain death for all insects after contact. Death occurs within 15 minutes to a few hours, depending on the insect. According to reports, Dianol b, actual test has retained its effectiveness for many years. Available in ¼-pound and 1-pound cans as well as in bulk for quantity requirements. DIANOL SALES CORPORATION, ALLENTOWN, PENNSYLVANIA.

Engine water filter

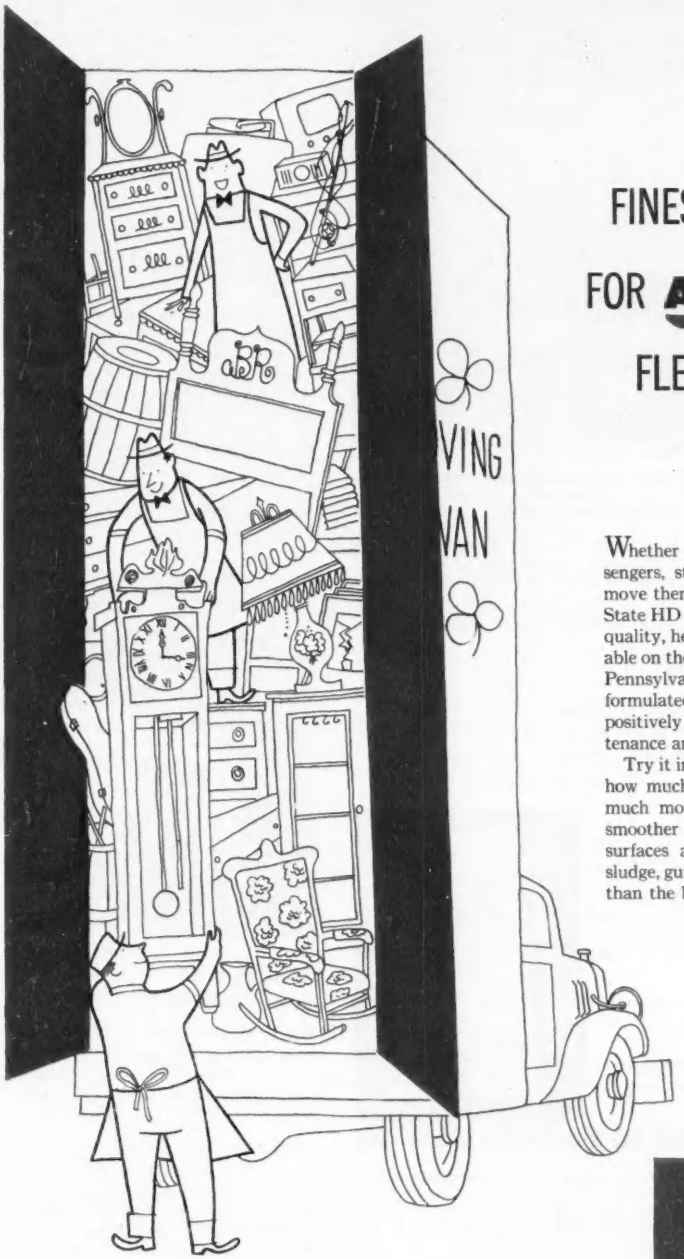
Designed for installation in trucks, buses and automobiles for the prevention of dangerous engine overheating, this Butler water filter can save motor oil, valves, pistons, rings and liners according to the maker. The centrifugal water filter action of the filter removes particles of scale, dirt, rust and sludge that clog water channels in the heat exchanger, radiator and engine block. No screens, pads or chemicals are used.

It is said to have a two-fold action: The rectifier section removes and prevents formation of mineral and rust scale. The filter section collects sludge in a glass collecting chamber where it is easily removed. The model shown above (C-40) is a centrifugalfilter and water rectifier, rated at a gallonage capacity of from 0 to 40 gal. BUTLER ENGINEERING COMPANY, INC., 2612 ROUSSEAU STREET, NEW ORLEANS 13, LOUISIANA.

Cooling system cleaner

This new device inhibits rust and corrosion in the cooling system, softens coolant water to stop scale deposits,

(*Continued on page 86*)



FINEST LUBRICATION FOR **ANY KIND** OF FLEET OPERATION

Whether you move pianos or public passengers, stuffed owls or foodstuffs, you'll move them faster and better with Quaker State HD Oil in your equipment. This top-quality, heavy-duty oil is the finest obtainable on the market. Made from 100% pure Pennsylvania grade crude oil and skillfully formulated with choicest detergents, it will positively help reduce your fleet maintenance and operating costs.

Try it in your equipment soon. Discover how much longer it keeps its body, how much more fully it protects, how much smoother and better it cushions friction surfaces and prevents the formation of sludge, gum and varnish. Why settle for less than the best? Use Quaker State HD Oil.

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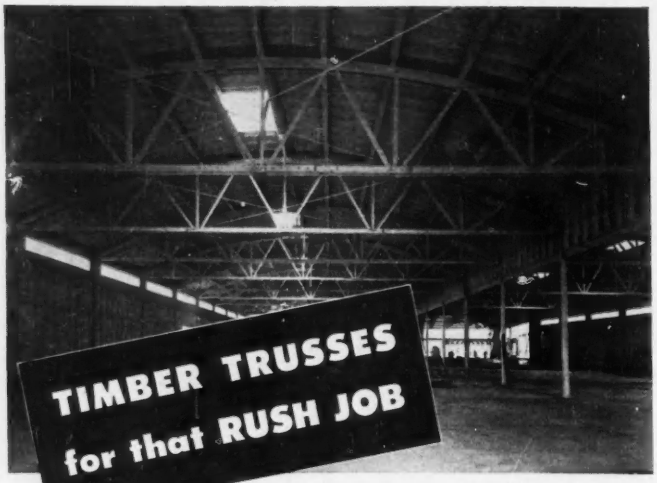
AND SUPERFINE LUBRICANTS



The 60' bowstring trusses for a Wisconsin warehouse were designed and fabricated by Unit Structures, Inc., Peshtigo, Wis.

Now in these emergency times timber construction is going ahead on early delivery schedules.

The widespread recognition of timber as an engineering material has given the building industry a new tool in this easily worked, versatile material.

Hangars and garages are being built with timber. So are warehouses, factories and other large structures. Heavy timber construction buildings, equipped completely with approved sprinkler protection, have shown a remarkable record of fire safety over many years.

The building profession now knows that, pound for pound, timber does as much work as other materials, and in its proper fields of use performs an equally satisfactory service, and generally at lower cost.

Timber fabricators in all sections of the country are ready to help you.

Specify timber — there's plenty of it and ready as usual for early delivery.

TIMBER ENGINEERING COMPANY, 1319 18th St., N.W., Washington 6, D. C.

Please send me FREE copy of "Pictorial Review of Hangar Fire Tests."

We plan to build a_____

NAME_____

COMPANY_____

STREET_____ CITY_____ STATE_____

ENR

New products . . .

and filters rust, scale and foreign particles from the coolant, according to the manufacturer. It is said to guard the cooling system against severe overheating, which is the frequent cause of scored pistons and cylinders, burned valves, cracked blocks and heads, as well as other troubles requiring extensive repairs.

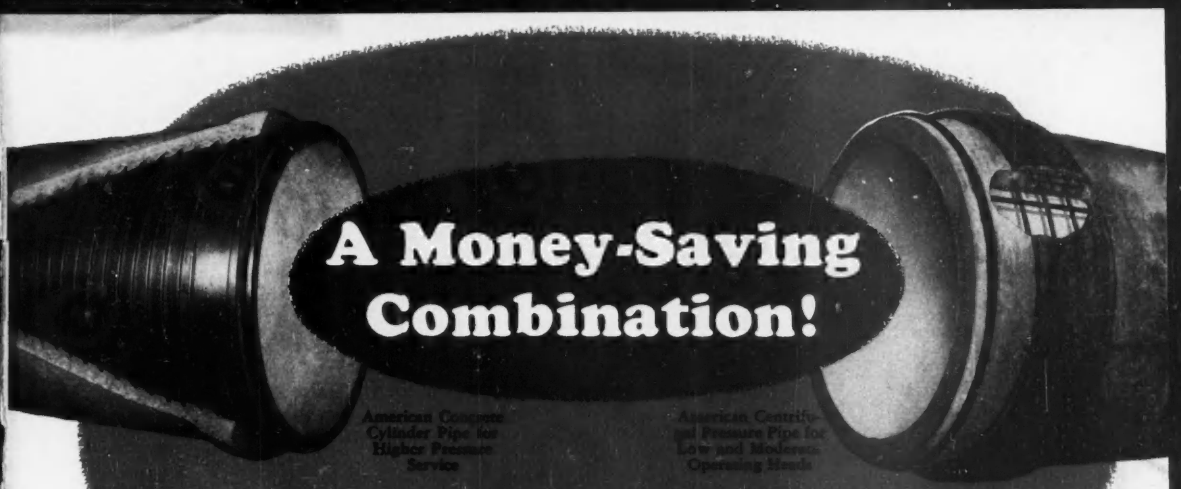
Here's how the device functions: A controlled amount of water flows continuously from the cooling system and enters the cleaner. Water contacts the softening and inhibiting chemicals in a replaceable cartridge, and passes through a filtering media where solids are removed. The filtered, softened water re-enters the cooling system and circulates throughout, with the result that coolant is free of particles, cannot cause scale deposits, rust or corrosion. The Fram radiator and water cleaner is said to be harmless to antifreeze and other radiator chemicals. FRAM CORPORATION, PROVIDENCE, RHODE ISLAND.

Grading with carpenter's level

Said to be amazingly accurate for leveling, grading and simple surveying, the "Trans-A-Level" incorporates the use of an ordinary carpenter's level fitted with small metal clips for sighting.

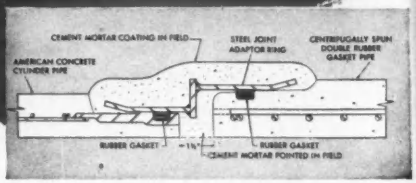
It can be placed on any handy platform; a carpenter's level is then placed on top, and the stub adjusting legs turned so that the "Trans-A-Level" is perfectly level. Spring clips are then slipped on the carpenter's level and the user sights along them as shown in the picture above, not unlike sighting a shotgun. It is said to be compact and can be carried in a tool box, according to the manufacturer, ARGYLE MFG. CO., COLCHESTER, ILLINOIS.

(*Continued on page 91*)


American Concrete Cylinder Pipe for Higher Pressure Service
American Centrifugal Pressure Pipe for Low and Moderate Operating Heads

A Money-Saving Combination!

Wherever Pressure Conditions Permit-- Different Classes of American Reinforced Concrete Pressure Pipe Can Be Combined in the Same Water Transmission Line


CEMENT MORTAR COATING IN FIELD
STEEL JOINT ADAPTOR RING
CENTRIFUGALLY SPUN DOUBLE RUBBER GASKET PIPE
AMERICAN CONCRETE CYLINDER PIPE
RUBBER GASKET
RUBBER GASKET
CEMENT MORTAR POINTED IN FIELD

Here's a typical example of the ability of American to meet specific project requirements... to give you a carefully laid out and engineered pipe line. You'll like the simplified planning and ease of installation this feature gives you.

By designing your pipe line to meet such specific project requirements you will achieve...

Greater Economy in Cost!

You know that reinforced concrete pressure pipe gives you the strength of steel and the permanence of concrete... with reductions in initial cost, lower installation costs, sustained capacity, and trouble-free service. Four classes of reinforced concrete pressure pipe are available to meet varying requirements.

So why not use the proper combination of these classes of pipe, where pressure ranges differ, to meet the needs not only of high pressure service but the needs of intermediate and low pressure service as well?

You'll find it the most economical way to plan a major capital investment...

...with Greater Savings in Critical Materials!

The conservative design principles of reinforced concrete pressure pipe are such that economical use may be made of steel and concrete to meet design requirements with appreciable savings in critical materials.

During the present defense emergency, these are valuable savings to make... and, they are savings that ease the problems of procurement, with less drain on the national economy.

So... if you find that the pressure ranges in your line are going to differ widely, give us the opportunity to show you how the combination of different classes of American reinforced concrete pressure pipe can save you money.

How American Concrete Cylinder Pipe Is Joined To American Non-Cylinder Pressure Pipe

A simple adaptor ring provides the transition between the spigot ends of two different classes of pipe.

In all classes of reinforced concrete pressure pipe manufactured by American, the rubber gasket is confined by a joint ring to a definite groove in the spigot end of the pipe, thus assuring the most positive and safest use of the gasket as a water seal under all normal operating conditions.

Recent Typical Installations Where This Feature Is Being Used to Obtain REDUCTIONS IN THE COST OF DELIVERED WATER

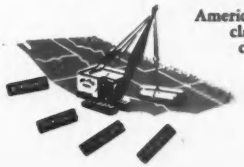
San Dieguito Irrigation District, Encinitas, California

City of Whittier, California

City of Pasadena, California

Pomona Valley Municipal Water District (now being installed) Pomona, California

Four Plants to Serve You



American manufactures four classes of reinforced concrete pressure pipe in diameters ranging from 12 in. to 12 ft., and for all pressures related to to modern American waterworks practice.

American PIPE AND CONSTRUCTION CO.

Concrete Pipe for Main Water Supply Lines, Storm and Sanitary Sewers, Subaqueous Pipe Lines
P. O. Box 3428, Terminal Annex, Los Angeles 54, California

MAIN OFFICES AND PLANT—4635 FIRESTONE BOULEVARD, SOUTH GATE, CALIFORNIA
DISTRICT OFFICES AND PLANTS—OAKLAND—SAN DIEGO—PORTLAND, OREGON

ACCURATE • *Hi-Speed* • FLEXIBLE

FOR BATCHING 2, 3 OR 4 MATERIALS . . . . . .

With more than double the filling area of most batchers, Johnson "Hi-Speed" Roadbuilders Batchers save important seconds in charging time. Big 15" x 36" valves are fast-filling . . . flexible, can be added or removed as needed to handle 2, 3 or 4 materials. For charging into truck mixers, "Hi-Speed" Batcher (illustrated) has a cement plug valve in place of one of the 4 aggregate fill valves. Truck-mixer-type weigh-hopper, available in 2, 3 or 4-yard sizes, has 4 compartments . . . 1 for sand, 2 for aggregates, and 1 enclosed compartment for cement. Double-clam discharge gate is easily tripped, opens wide . . . steep slopes of hopper give fast discharge.

A wide-discharge hopper, for standard 34-E paver batch, is readily interchangeable with truck-mixer hopper on same scale frame. Overhead unit frame supports all fill valves, hand levers, hopper and weigh-beam box . . . provides convenient reassembly, insures accurate alignment of scale parts at all times.

For top batching speed on your jobs, plus extremely accurate weighing for uniform strength every batch, use Johnson "Hi-Speed" Batchers. Call your Johnson distributor today, or write direct to . . .

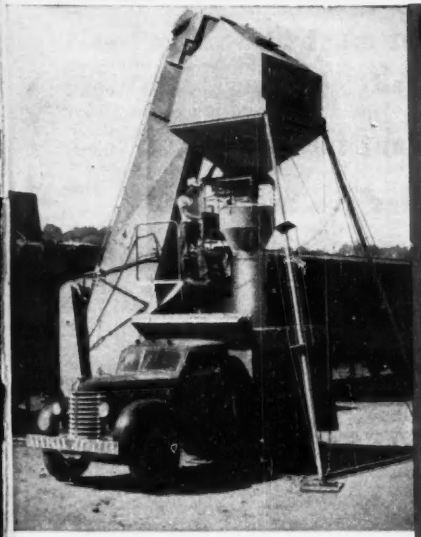
C. S. JOHNSON CO., CHAMPAIGN, ILL.

(Koehring Subsidiary) CJ236

KOEHRING PRODUCT

JOHNSON *Roadbuilders* BATCHERS

MIX PLANTS • BINS • SILOS • ELEVATORS • CHARGERS • HOPPERS • CLAMSHELL CONCRETE BUCKETS

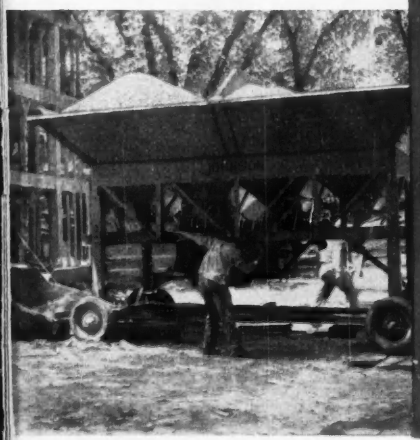


MULTIPLE-PURPOSE JOHNSON ELEVATING CEMENT CHARGER

can be used as a batch plant or transfer plant. For batching, standard Charger has a size 14, 1000-lb. cap. cement weigh batcher, hung under a 33-bbl. storage hopper. To charge dual-batch trucks, two 1000-lb. batchers can be used. Converts to transfer plant by removing batchers and cone, and bolting a 50-bbl. extension to the hopper.

8, 20, OR 30-TON CAPACITY LO-BIN TROLLEY BATCHER

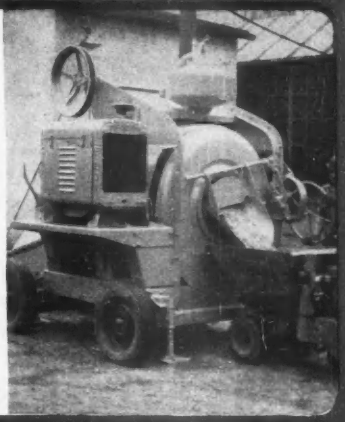
is only 7½′ to 9½′ high for easy charging with front-end tractor loader. Lo-Bin has 2, 3 or 4 compartments, up to 4 weight beams, 22 or 44 cu. ft. weigh hopper . . . or can be arranged for 2 or 3 aggregates and 1 bulk cement compartment. Efficiently serves 28-S, 16-S, 11-S, 6-S mixers. Wheels, pneumatic tires and handy tow-bar are optional.



NEW features on Kwik-Mix 16-S DANDIE®

Latest 16-S Dandie concrete mixer, interchangeable side or end discharge, has adjustable double-contact skip shaker, automatic water system, 3-point suspension mounting on heavy coil springs, cast steel drum heads with machined roller paths. Also, exclusive remixing action, Flow-Line discharge. Other models: 3½-S, 6-S, 11-S . . . bituminous, plaster-mortar, mixers, power wheelbarrow

KWIK-MIX (Koehring Subsidiary)
Port Washington, Wis.



"CURB-HUGGING" Parsons 221 Trenchliner®

With shiftable boom for digging within 10″ of side obstructions, and reversible power-shift spoil conveyor that shifts through machine in less than 1 min., Parsons 221 Trenchliner hugs curbs, poles and buildings without swerving from grade line. It digs 16 to 36″ wide . . . 8′-6″ deep. With full reverse, the 221 makes vertical set-ins, undercuts sidewalks, sewers, old mains. Ask about 4 other sizes.

PARSONS (Koehring Subsidiary)
Newton, Iowa

MORE WORK-TIME with Koehring Dumptor®

With more than a ton Dumptor strength for every ton of payload capacity, Koehring 6-yd. Dumptor withstands severest loading shocks. Sides, end and triple-strength bottom of all-welded body are heavily reinforced. Gravity dump eliminates body hoist maintenance. Same forward and reverse travel speed gives fast shuttle hauling. Check Koehring excavators and cranes.

KOEHRING COMPANY
Milwaukee 16, Wis.
W65

if

—your compressor plant must be independent or isolated

—economy is an important factor

—existing power facilities are overloaded

—steam or electricity is not readily available

Ingersoll-Rand XVO Diesel-Powered Units are the answer to your compressor problems

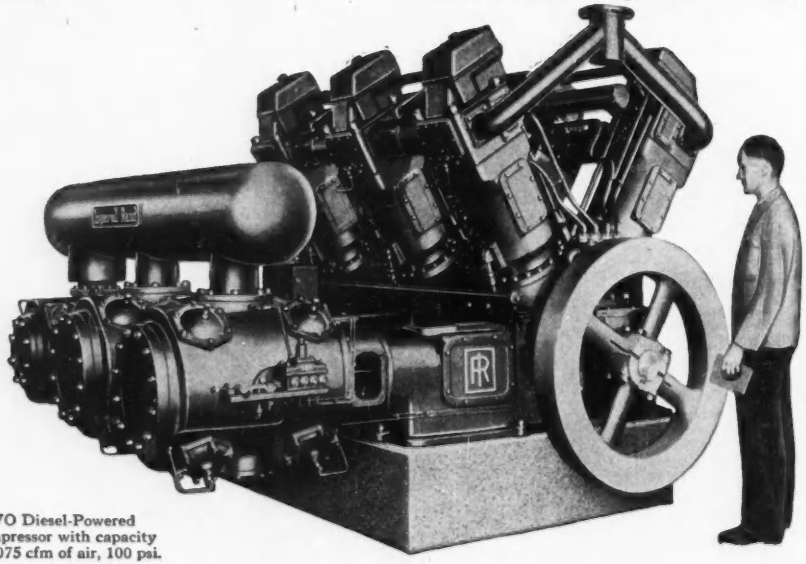
Here's an all-in-one diesel engine and compressor unit that has no equal for space-saving, cost-saving economy—plus proved *dependability* of the entire compressor plant.

The heavy-duty, double-acting compressor cylinders and four-cycle, V-angle power cylinders are mounted on a single, compact frame. The pistons in both the power and compressor cylinders are connected to the same crankshaft. Power loss between engine and compressor is practically eliminated—resulting in lowest fuel cost per cfm of compressed air or gas.

The XVO permits important savings in installation cost, too, as it is normally shipped fully assembled and ready to mount on a small inexpensive foundation.

Ingersoll-Rand XVO diesel-powered compressors are available in 335, 700, 1075, and 1450 cfm sizes (100 psi air), with 2, 4, 6 and 8 power cylinders respectively. Compressor cylinders for any pressure or vacuum can be furnished.

For further information, see your nearest I-R representative. Or write for a copy of Bulletin No. 3172-A.



6XVO Diesel-Powered Compressor with capacity of 1075 cfm of air, 100 psi.

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y. 726-6

COMPRESSORS • AIR TOOLS • ROCK DRILLS • TURBO-BLOWERS • CONDENSERS • CENTRIFUGAL PUMPS • DIESEL AND GAS ENGINES

New Product Briefs

Paratex, a **one-coat interior wall and ceiling soft matte finish,** has been recently announced by **Truscon Laboratories, 1700 Caniff Avenue, Detroit 11, Mich.** According to the manufacturer it can be applied directly to plaster walls without any sealers underneath. Usable with brush, roller or spray, it can be dissolved by turpentine or any other paint thinner.

A "Western-palette" of color-toned **penetrating wood sealers** designed to preserve wood grain and minimize warping and swelling is being introduced by the **Monsanto Chemical Company, St. Louis 4, Mo.** Color values of the sealers are complementary and may be used in any combination to achieve a smooth harmony. These sealers will be available through paint, lumber and hardware wholesalers in quarts, gallons and five-gallon cans.

New **full-wall panels** which are thoroughly waterproofed have been developed and introduced by the **Upson Company of Lockport, N. Y.** Known as Upson Strong-Bilt waterproofed panels, they are the largest on the market, measuring 8 ft x 18 ft. Tests conducted by the Pittsburgh Testing Laboratory proved the new panels do not absorb more than 13.5 percent by weight when entirely submerged in water for 24 hr.

A new **small synchronous motor** with unusual operating characteristics has been announced by the **Allis-Chalmers Manufacturing Company, Milwaukee 1, Wisconsin.** Operating on the reluctance principle, it has no brushes, slip rings, rotating coils or permanent magnet. It can be built to operate continuously at any voltage below 250 volts, either single phase or polyphase, and should interest designers of control systems, instrumentation, and military and industrial equipment. Four inches in diameter by 2¾ inches in length, it weighs 2.6 lb and develops 8 ounce-inch starting torque and 0.8 inch synchronous torque.

A new **aluminum paint** has been developed for withstanding extreme heat as high as 1,200 deg F. Known as HI-TEMP, it is said to insure lasting protection against peeling, discoloring, blistering and all other problems caused by extreme heat. Manufactured by the **Illinois Bronze Powder Co., 2023 So. Clark St., Chicago, Ill.,** it is said to need no special surface preparation as one coat covers by brush or spray and it dries in 1 to 2 hours.

(Continued on next page)

UNIT TV*

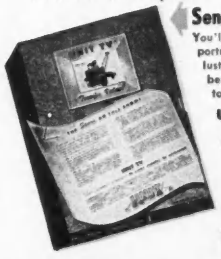
*Terrific Value...
IN EVERY CHANNEL OF OPERATION!

FAST WORKING and FAST TRAVELING of the UNIT 1014, provide the HIGHLIGHTS of PERFORMANCE. Features include: Twin hook-rollers . . . Tandem rear axles with full floating beam suspension, plus large diameter wide-faced air brakes on all 4 rear wheels. The equalized distribution of weight, allows short turning for close quarter operations and insures perfect balance. Equipped with hinged type boom for safe, easy travel. Road speed up to 32 MPH. Rated ½ yd. as an excavator, with a lifting capacity exceeding 10 tons at a 10 ft. radius, makes this a two engine equipped truck crane that can really withstand the impacts of heavy duty operations.

Select Your Favorite UNIT Star

★ UNIT 357 Mobile Type ½ Yard Excavator Crane up to 9 tons.
★ UNIT 614 Crawler Type ½ Yard Excavator Crane up to 8 tons.
★ UNIT 1020 Crawler Type ¾ Yard Excavator Crane up to 10 tons.
★ UNIT 1520 Mobile Type ¾ Yard Excavator Crane up to 20 tons.
★ UNIT 1014 Truck Crane ½ Yard Excavator Crane up to 12 tons.
★ UNIT 1520T Truck Crane ¾ Yard Excavator Crane up to 20 tons.

All Models Convertible to ALL Attachments.



Send for a UNIT "TV SET"
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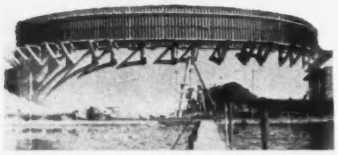

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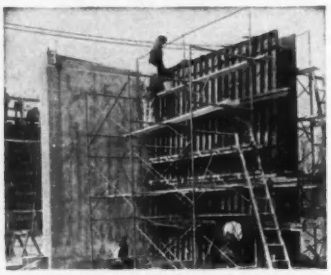

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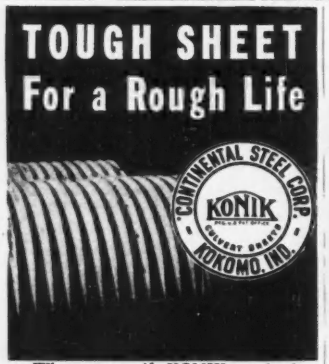

When you specify KONIK metal culvert sheets you can be sure you're getting extra years of trouble-free culvert service. KONIK stands the rigors of rough abuse—resists rust and corrosion—because it's a tougher culvert sheet. Copper, nickel and chromium make it tough and strong. That's what you need for a long culvert life. Insist on KONIK. Continental Steel Corporation, Kokomo, Indiana.

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Continental Culvert Sheet Distributors are glad to show the KONIK warranty and the certified analysis that assures longer culvert life with KONIK metal.

*Due to present National Defense requirements for nickel & chromium, two critical war materials, Continental Fence at present is available in Copper Steel only.

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Send For This New Water Filtration Data

BULLETIN B-12 on general filtration principles; BULLETIN B-12-W details information on filtering potable and waste water.

DICALITE DIVISION
GREAT LAKES CARBON CORPORATION
612 S. Flower St., Los Angeles 17, Calif.

MANUFACTURERS' PUBLICATIONS

Waylite masonry units—Waylite is a light-weight cellular aggregate, refined and expanded by a process of agitating and rapid cooling. This process expands and fills the material with minute air cells or bubbles, completely sealed. These air cells are the active insulation and lightweight principle in all Waylite aggregates. This 16-page folder is essentially concerned with masonry units including interior finishes, masonry walls, floor and ceiling construction, as well as back-up walls and partitions. In addition, charts and information are provided showing Waylite aggregate for plain and reinforced concrete, also for roof and floor fills. THE WAYLITE COMPANY, 105 WEST MADISON STREET, CHICAGO 2, ILL.

Sealtight Paving Products—The interesting fact brought out in this 8-page booklet is that all paving products can be purchased and shipped from a single source. The company offers asphalt, corkfill and fibre expansion joints, center strips, dummy joints, concrete curing compounds, subgrade paper, base plates, rubber asphalt joint seal, sewer joint compounds, and road-marking paints. The three types of joints are pictured with general descriptions, physical properties, and standard specifications as well as sizes, thickness, and installation instructions. W. R. MEADOWS, INC., ELGIN, ILLINOIS.

Planned lubrication—A new two-color, 20-page bulletin gives full details on 7 Keystone specialized lubricants that cover the majority of plant requirements, with a minimum of different types and densities. Information includes: lubricant characteristics, benefits, uses, densities, specifications and container sizes. Products covered are lubricants for ball and roller bearings, plain and ring bearings, open gears, enclosed gears, speed reducers, and oils for cleaning, loosening and penetrating. The Bulletin BK-19, can be obtained from KEYTONE LUBRICATING COMPANY, 21ST, CLEARFIELD AND LIPPINCOTT STREETS, PHILADELPHIA 32, PA.

Refractory coatings—This bulletin cites many product tests for CERA-KOTE, a super refractory coating applicable by brush or spray. Tests include those

(Continued on page 95)

Outstanding

BY EVERY STANDARD OF COMPARISON

Use any yardstick you wish to measure the worth of an excavator — range, capacity, speed and ease of control, durability, low maintenance — or that all-important criterion: steady, big-output performance. You'll find that Bucyrus-Eries rate "outstanding" on all, because their advanced design and construction is backed by unequalled experience in building excavating machinery for use all over the world. A complete line of shovels, cranes, draglines, stripping shovels and walking draglines from 2½ to 36 cubic yard sizes provides a machine to fit any job requirement.

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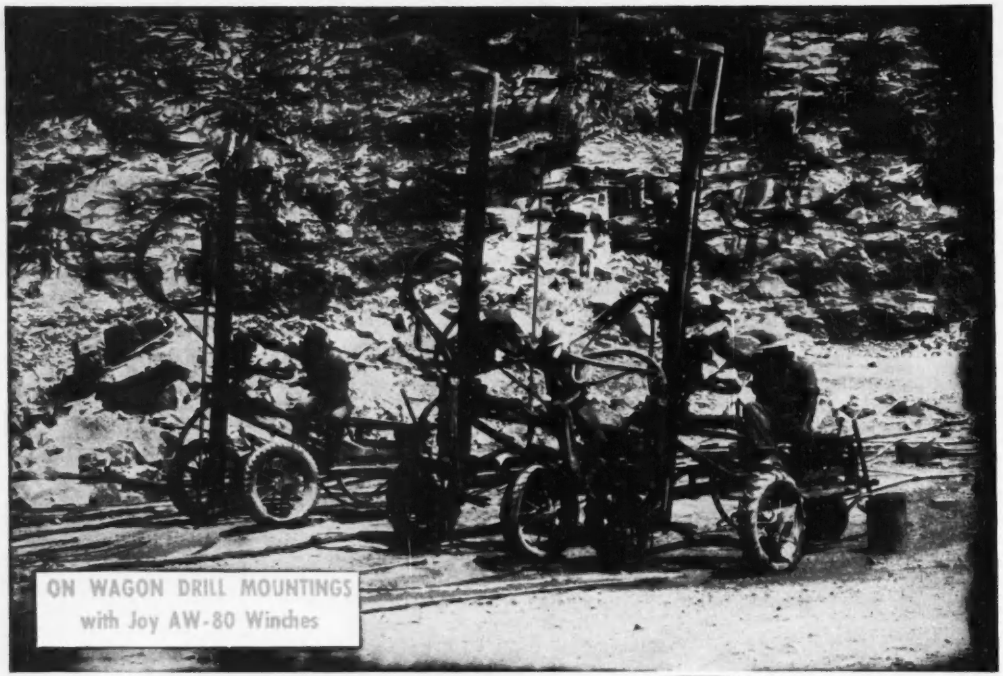
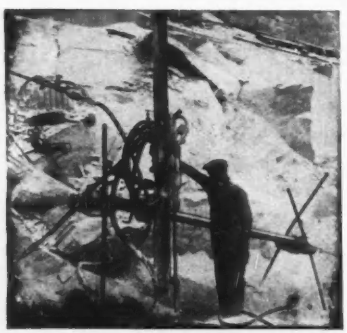


ON WAGON DRILL MOUNTINGS
with Joy AW-80 Winches

Put JOY SILVER STREAK DRIFTERS TO WORK ON YOUR JOB—



ON QUARRY-BAR MOUNTING

Watch daily footage INCREASE and costs per foot go DOWN!

JOY Silver Streak Drifters feature the exclusive *Dual Valve* with positive cushion control. It gives a harder, more powerful punch—literally makes air do more work. What's more, JOY Drifters *last longer*—give you more feet of hole with less maintenance. Exclusive *cadmium plating*, inside and out, inhibits rust, prevents scoring during run-in, and at the same time, adds power by permitting closer piston tolerances. ● Ask for a trial demonstration on JOY Drifters—the T-300, T-350 or T-400—*prove their all-around superiority right on the job!*

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W&D P 2818

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Manufacturers Publications . . .

used in industrial heat-treating furnaces, kilns, ovens, boilers, etc., where the coating has increased refractory life by as much as 30 percent. A partial check list of users and uses of the product are included in the folder, noting application to both brick and plastic refractories. It describes how the product serves as a preventive against slag penetration, abrasive wear, flame erosion, corrosive gases, molten metal, and thermal shock. Write on your company letterhead to WILLISTON & COMPANY, PEOPLES BANK BUILDING, DELTA, OHIO.

Plywood-steel forms—Atlas Compo forms are a completely assembled square edge unit consisting of a welded steel frame with a plywood base. They are ready for use as soon as they reach the job. A new 4-page folder describes their make-up, sizes, weight, etc. The plywood panels have their entire perimeter protected by a steel angle. Due to their unique design, they are light in weight and are said to have extremely long life. Illustrations show how one single panel can be removed without disturbing adjoining forms. This is especially desirable when boxes, sleeves, pipes are to be installed. IRVINGTON FORM AND TANK CORPORATION, ATLAS COMPO FORM DIV., 20 VESEY STREET, NEW YORK 7, N. Y.

Flat-base pipe—Here is an illustrated brochure describing the company's various sizes and shapes of reinforced concrete flat-base pipe. The pipe is used upright or inverted for culverts, pedestrian underpasses, cattle passes, utility galleries and manholes. Produced ready for use on the job without modifications, the flat-base sections can be laid in new fills or jacked through old construction. Conveniently-located lifting holes facilitate handling and positioning. Joints are all tongue-and-groove, water-tight with rubber gaskets. Manufactured in sections 46x46 to 97x97 by UNIVERSAL CONCRETE PIPE COMPANY, 297 SOUTH HIGH STREET, COLUMBUS, OHIO

"Building Guide for Good House Painting" is the title of a 12-page booklet intended to assure long-lasting paint jobs on homes. Dealt with in detail are methods of preventing accumulation of excess moisture in walls—the greatest cause of paint failures. WEST COAST LUMBERMEN'S ASSOCIATION, 1410 S.W. MORRISON STREET, PORTLAND 5, OREGON.

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SEMI-FINISHED HOMES built by Ralph Cambell at Fort Worth, Texas. The houses are completely finished on the exterior by the contractor, while the interior is left for the buyer to complete to his own taste and specifications.

Experiments in budget-building

Some of the nation's contractor's, searching for an answer to the home financing dilemma, are trying some unusual experiments.

Their problem stems from the government's approval of private mass-building of dwelling units in areas classified for defense housing. The rub is that the government has established cost and rental rate ceilings in the same classified areas. Contractors soon discovered these ceiling prices were hard to meet without losing money. Others, in non-defense areas are up against tight credit restrictions. To some, solution to the problem seems to lie in revising building methods.

Search for the right answer has caused much experimentation that may provide a new pattern for future low-priced housing.

Here is how three contractors are trying to meet the demand of this budget building:

• **Fort Worth, Texas**—Home builder, lumberman and developer, Ralph G. Cambell, is selling houses with no down payment, or for as little as $300, and only $40 to $45 monthly payments. Mr. Cambell's trick is to completely finish the house on the exterior, installing the plumbing and then let the home owner finish out his house to his own specifications. In the last three years he has built and sold 400 houses, and has started two developments of his own. The majority of his customers fall into the $200 to $300 monthly income group willing to finish their own home and save the labor costs.

That is where the secret lies. Up to the time Mr. Cambell turns the house over to the buyer, the cost of materials is about four times the cost of labor.

From then on, the cost of labor is about twice as much as materials.

Building a home with Mr. Cambell can be handled two ways. If you own your own lot there is no down payment. If you build on one of his lots the down payment runs between $250 and $300. Building on the buyers lot costs $2,795 and monthly payments are between $40 and $50. On Mr. Cambell's lots the cost is $3,595 and after the down payment $40 a month.

Financing, Mr. Cambell consider the key to his entire program. Over the last several years he has developed several mortgage financing sources. His own firm, the Johnson Cambell Lumber Co. carries the homes until the buyer has increased his equity by completing some of the work on the interior. Then a group of notes are put up as collateral to a loan.

The lumber company continues to service the loan, and as the buyer makes his monthly house payment, he is given an opportunity to buy the material to help him finish his home. So far, government credit restrictions have tended to increase the demand for this type of housing, according to Mr. Cambell.

• **Madison, Wis.**—A similar plan is being attempted by Contractor F. B. A. Sokoloski here. Only one dwelling is being built at present, but the contractor considers it an experiment that will provide experience and predict his next year's building plans.

An agreement between the owner and Mr. Sokoloski permits the owner, Michael Bennett, a city employee, to do as much of the labor as he is able. So far he has put in pre-fabricated windows, hung his doors, put on his roof boards and, over the weekends, has been putting the shingles on his roof.

Mr. Sokoloski has put in the basement, framed the house and put on the sheathing. Part of this work, Mr. Sokoloski said, could probably be done by the owner but was undertaken by the contractor in a rush against winter weather.

The home is located in a temporary housing project of the Madison Housing Authority. The MHA rents at the project are low, but combining low rents with low income many prospective owners still find it difficult to save enough for a down payment.

Under this arrangement the contractor owns the house until it is completed. A six-month deadline is set for the finished house. When the house is finished it is deeded to the owner with the price only the actual cost of materials and labor supplied by the contractor.

The owner must agree to live in the house for 10 years in order to take full advantage of the contractor's offer to donate profit and overhead to the initial project. If the owner moves before the time agreed, he is given a 10% credit on the combined profit and overhead for each full year he has lived in the house.

• **Columbus, Ohio**—A third plan to aid the low income buyer is being offered in Columbus, Ohio. Called the "layaway" plan; the prospective buyer can make down payment installments over a one-year period while the house is being constructed. When the legal minimum down payment is made the customer moves in and begins his regular monthly payments toward complete ownership.

WORKS BOTH ENDS

ON BIG STEEL MILL PROJECT...

Get it done . . . and fast! That's the "word" at the site of U. S. Steel Company's new Fairless Works. And that's the reason James Armour Excavating Company is using two MICHIGAN Truck Cranes to handle and distribute materials at this huge steel mill project.

Here's just one example cited by operator Randall Auer: One of the MICHIGANS transferred pipe from a freight car to a truck, then followed the truck to a spot half-a-mile away where it unloaded the pipe. It then accompanied the empty truck back to the car for another load. The process was repeated until all the pipe had been removed from the car. Only MICHIGAN'S *speed and mobility* made it possible to work both ends of this job with one crane.

When you need an excavator-crane that has everything you want *plus* speed and mobility, investigate MICHIGAN . . . most complete line of ¾-yard and ½-yard excavator-cranes available. Write for full details.

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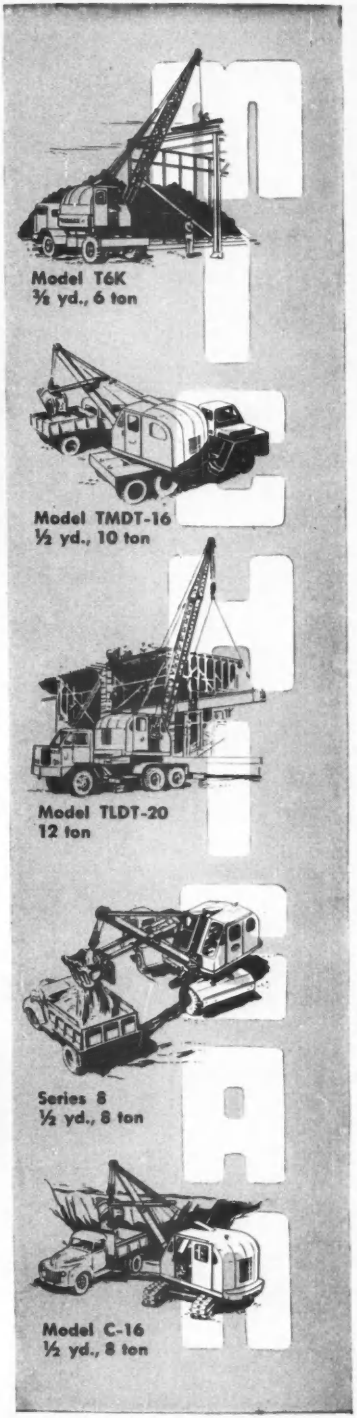
500 Second Street, Benton Harbor, Michigan, U.S.A.



Model T6K
⅜ yd., 6 ton

Model TMDT-16
½ yd., 10 ton

Model TLDT-20
12 ton

Series 8
½ yd., 8 ton

Model C-16
½ yd., 8 ton

Crawler trencher digs 4′ ditch 7½′ deep with help of 68 TIMKEN® bearings

THIS Model 320 is reported to be the only crawler type trencher that can dig a 4′ ditch 7½′ deep at the rate of 10 to 12 lineal feet per minute. To keep its many moving parts operating, with minimum maintenance and time-out on the job, Cleveland Trencher Company uses a total of 68 Timken® bearings in the differential, transmissions and track rollers.

Timken tapered roller bearings take radial and thrust loads in any combination, hold shafts in rigid, positive alignment. Proper gear meshing and a smooth flow of power is assured.

Because they keep housing and shaft concentric, Timken bearings make closures more effective. Lubricant stays in, dirt stays out—reducing wear and maintenance.

Timken bearings provide extra load carrying capacity because of line contact between rollers and races. They normally last the life of the machine because they're engineered for the job, precision manufactured and made of special analysis Timken fine alloy steel.

No other bearing can give you all the advantages you get with Timken tapered roller bearings. Make sure you have them in the machines you buy, or the machines you build. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

How **CLEVELAND TRENCHER COMPANY** mounts the track rollers of its Model 320 trencher on Timken bearings to assure long life and minimum maintenance.

WE MAKE OUR OWN STEEL

The special grade alloy steel which gives Timken bearings their strength and resistance to wear is made in our own steel mills.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

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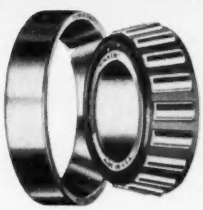
TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◐ AND THRUST ⟷ LOADS OR ANY COMBINATION